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OCT 1 193

Manufacturers Record

Reg. U. S. Patent Office

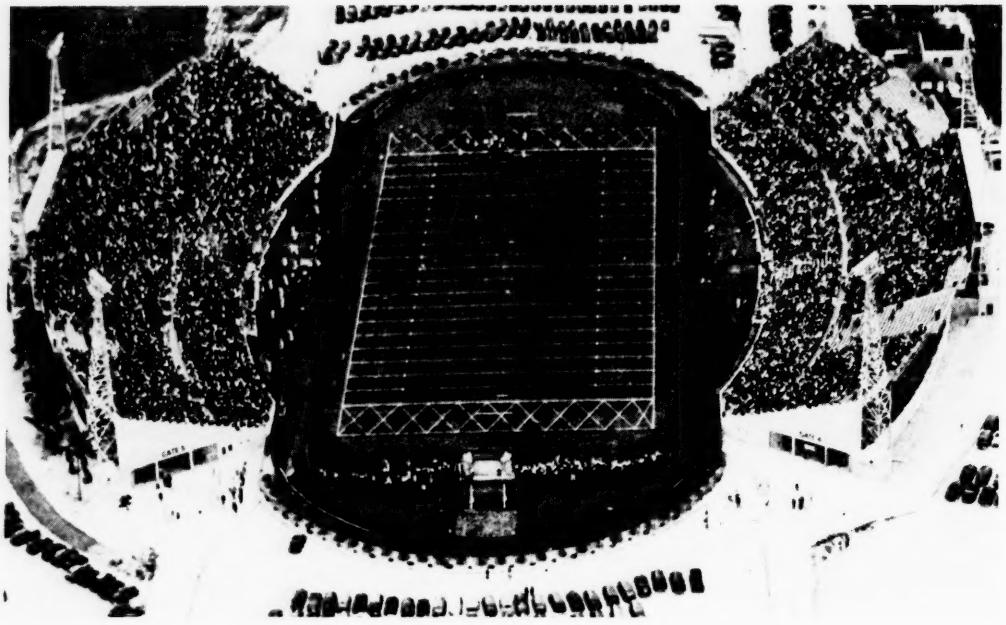
A BRIGHTER WORLD—

War has been averted. The horrors of another conflict, which seemed inevitable, have engaged men's thoughts to a degree that halted ordinary activities and caused the people of every country to pray that another cataclysm, with its immeasurable awfulness, might not come upon the world.

Skies are brighter now and profound gratitude is finding expression everywhere. The misguided belief that war is the way to settle disputes has been put aside, while the grievous setback which would come upon civilization as a result of armed conflict between nations has been postponed indefinitely.

The relief of tension upon men's hearts will find expression in greater activity in the affairs of everyday life.

OCTOBER, 1938



ALL ON DECK

Orange Bowl—A Virginia Bridge Stadium

The Orange Bowl Stadium was built by the City of Miami, Florida, for its many Athletic events throughout the year and for the Annual Orange Bowl Game on New Year's Day.

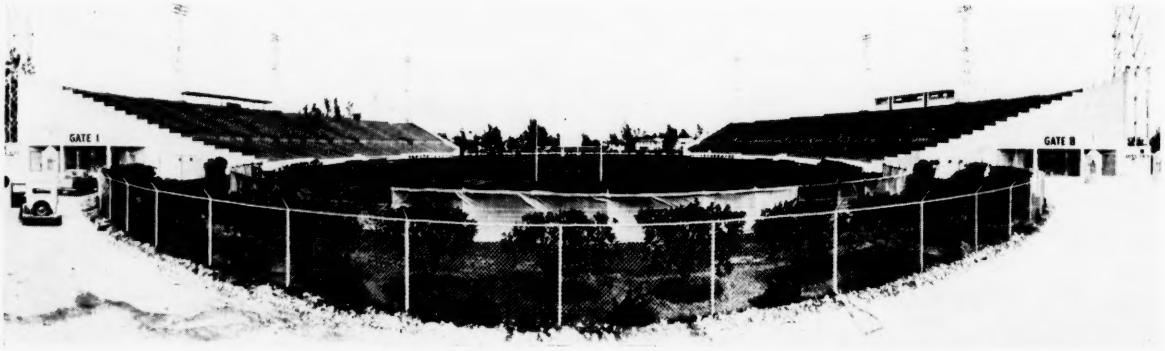
Full investigation indicated the economy and efficiency of the Virginia Bridge Steel Stadium with the Virginia Bridge Steel Deck. The results pleased everybody. The Orange Bowl Stadium seats 25,000 and additional seating can readily be added as needed.

Virginia Bridge

STEEL STRUCTURES

VIRGINIA BRIDGE COMPANY

Roanoke	Birmingham	Memphis
Atlanta	New York	Dallas



Entered as second class matter at the postoffice, Baltimore, Md., under the act of March 3, 1879. Volume CVII, No. 10 Monthly

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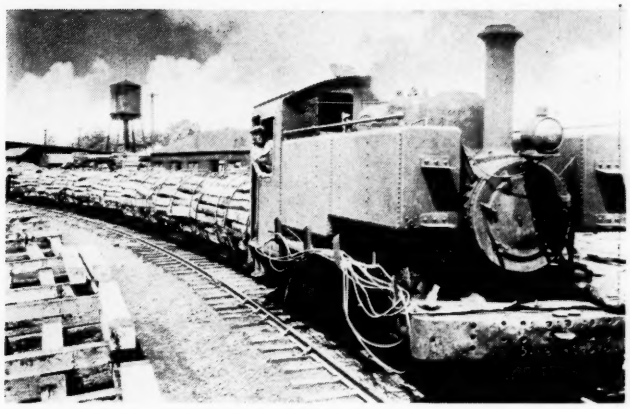

Transporting ties to the wood treating plant, Louisiana and Arkansas railroad.

MANUFACTURERS RECORD

Devoted to the Upbuilding of the Nation Through the Development of the South and Southwest as the Nation's Greatest Material Asset

Published Monthly

by the

MANUFACTURERS RECORD PUBLISHING CO.

Frank Gould, President

Main Office: Manufacturers Record Building, Commerce and Water Streets, Baltimore, Md. Phone: Plaza 7080-1.

Branch Offices:
New York—11 W. 42nd St. Phone: Longacre 5-7180
Chicago—28 East Jackson Blvd., Room 1510
Phone: Harrison 5867

Subscription Rate: $2.00 a year (in advance). Single copies, 25c; back numbers, one to six months, 50c each; over six months, $1.00. Combination rate for Manufacturers Record and Construction bulletin, $11.00 a year.

Subscribers are asked to notify us of change in address to avoid delay in service.

PUBLISHERS OF CONSTRUCTION AND BLUE BOOK OF SOUTHERN PROGRESS

Member
A.B.C.

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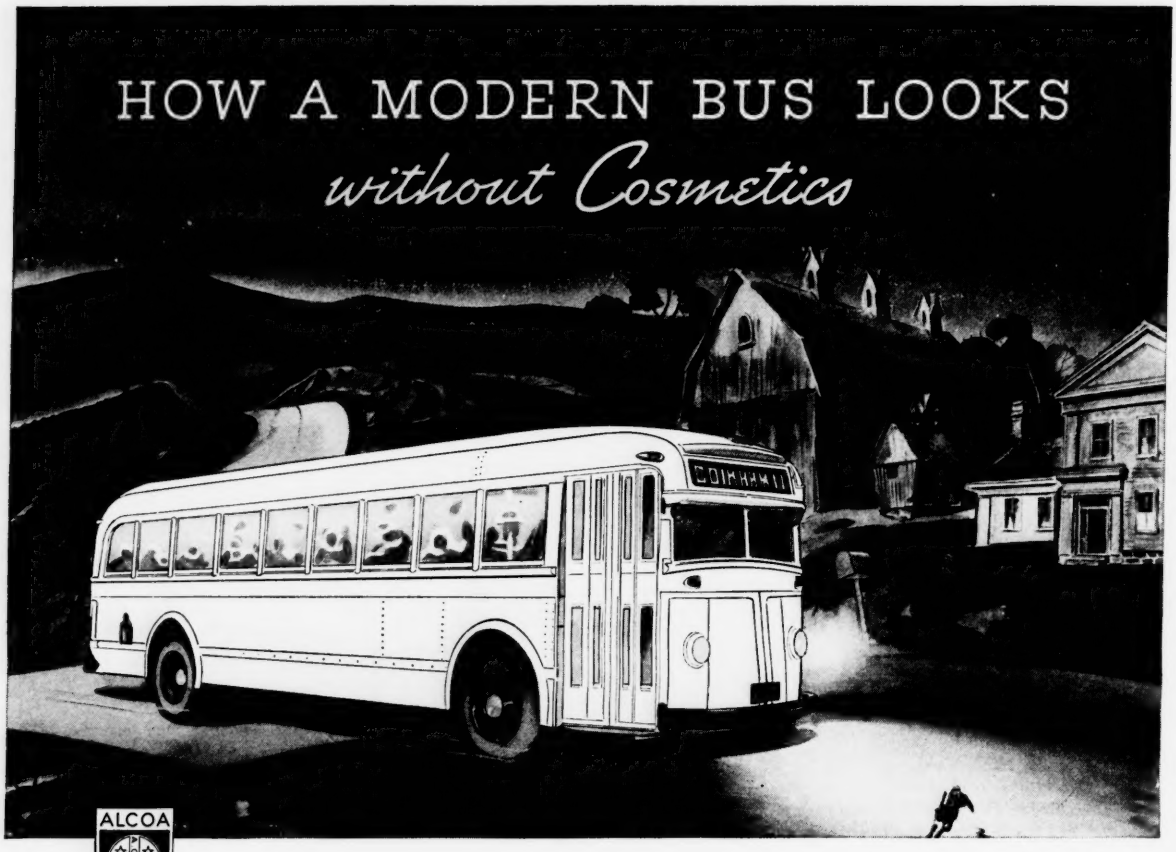
Cover—Continuous Feed Centerless Grinding Operation by courtesy of The Carborundum Company, Niagara Falls, N. Y.

HOW A MODERN BUS LOOKS *without Cosmetics*



ALCOA

UNDER THE RAINBOW COLORS of the modern bus is the most significant fact in transportation: The strong alloys of Aluminum are the Safe Way to Lightness.

Buses **have** to be light, these days. Dead load is expensive to haul around. Operators have to have buses spacious enough to carry many passengers in comfort, yet light enough to be agile in starting and economical to run.

From the very beginning of the trend to lightness, bus builders and operators have recognized that the need for both lightness **and** safety is a clear call for Aluminum.

Nature made Aluminum light, and research has made it strong. With this unbeatable combination, builders can throw off thousands of pounds of weight and still have a structure that is inherently stiff, dependably rigid, strong, and able to absorb the impacts of service.

Every important bus builder in America uses this safe way to lightness. They build throughout of strong Aluminum Alloys, in the form of rolled and extruded shapes, sheet and rod, castings and forgings. They build economically, because Aluminum is easy to fabricate. Ordinary shop techniques are quickly adapted to handle this versatile metal.

Operators get, with Aluminum, not only weight saving with safety, but a bus that is easy and economical to maintain, and that has a high salvage value when the equipment becomes obsolete.

A LIFTABLE IDEA: ALUMINUM IS THE SAFE WAY TO LIGHTNESS

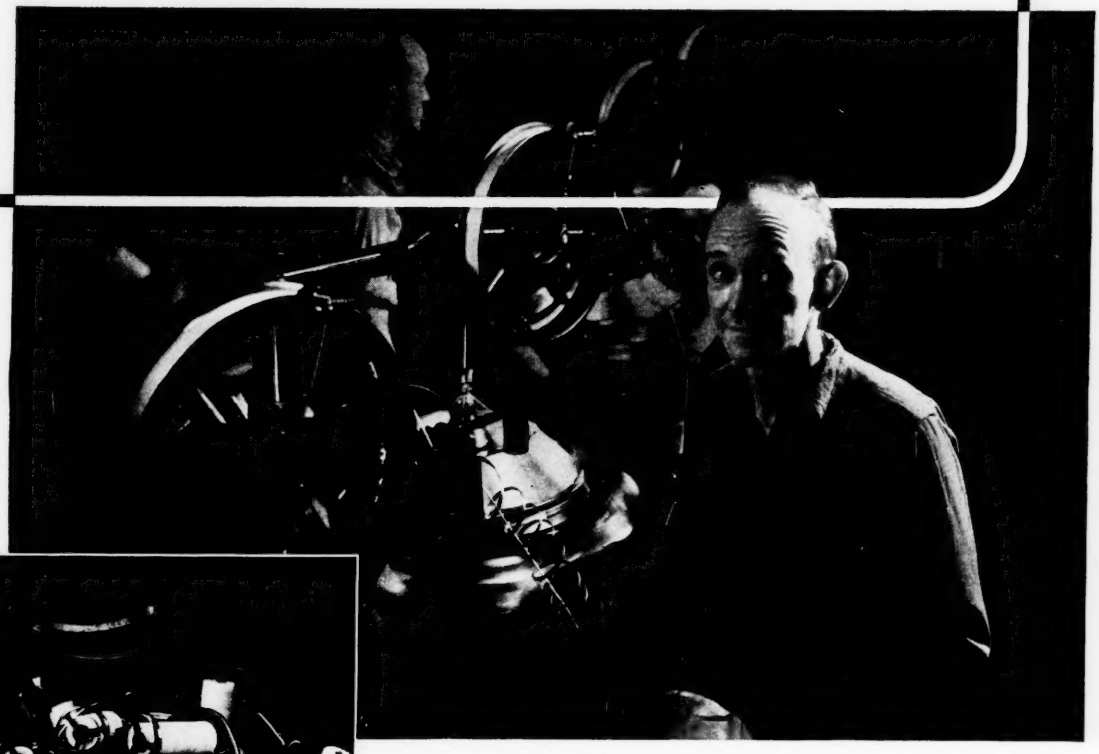
The whole transportation industry has adopted this simple idea. The airplane is Aluminum; buses, you have just read about. Railroads use this safe way to lightness for passenger cars, tank cars, and other equipment. Streetcars, too. Truck bodies and truck tanks are lightened with Aluminum. Bicycles and outboard motors. Gas engine and Diesel engine pistons and other parts.

Remember: Aluminum is the safe way to Lightness. It's a liftable idea, which we can help you put into practice, economically. Aluminum Company of America, 2109 Gulf Building, Pittsburgh, Pennsylvania.

THE *Safe* WAY TO LIGHTNESS

ALCOA · ALUMINUM

"I asked my boss for a BETTER OIL...



The large head rotors of this modern braiding equipment operate at a speed of 488 R.P.M., with the spools on the head rotating much faster. Gulf Harmony Oil is widely used for the lubrication of this type of equipment.

. . . now, with GULF HARMONY OIL in service, I turn out 20% more cord!"

(says this overseer)

"NOBODY can tell me that good lubricating oil doesn't have a lot to do with production," says this mill overseer. "Since my boss approved using Gulf Harmony Oil for this braiding machinery, as the Gulf engineer recommended, we've increased production 20%."

Scores of mills throughout the country are reporting improved production with lower costs for maintenance and fewer operating interruptions, after Gulf's higher quality oils have been placed in service. They find that the initial cost of good oils is an extremely small item when compared with the savings effected in power and maintenance costs and the improvements in production which accompany better lubrication.

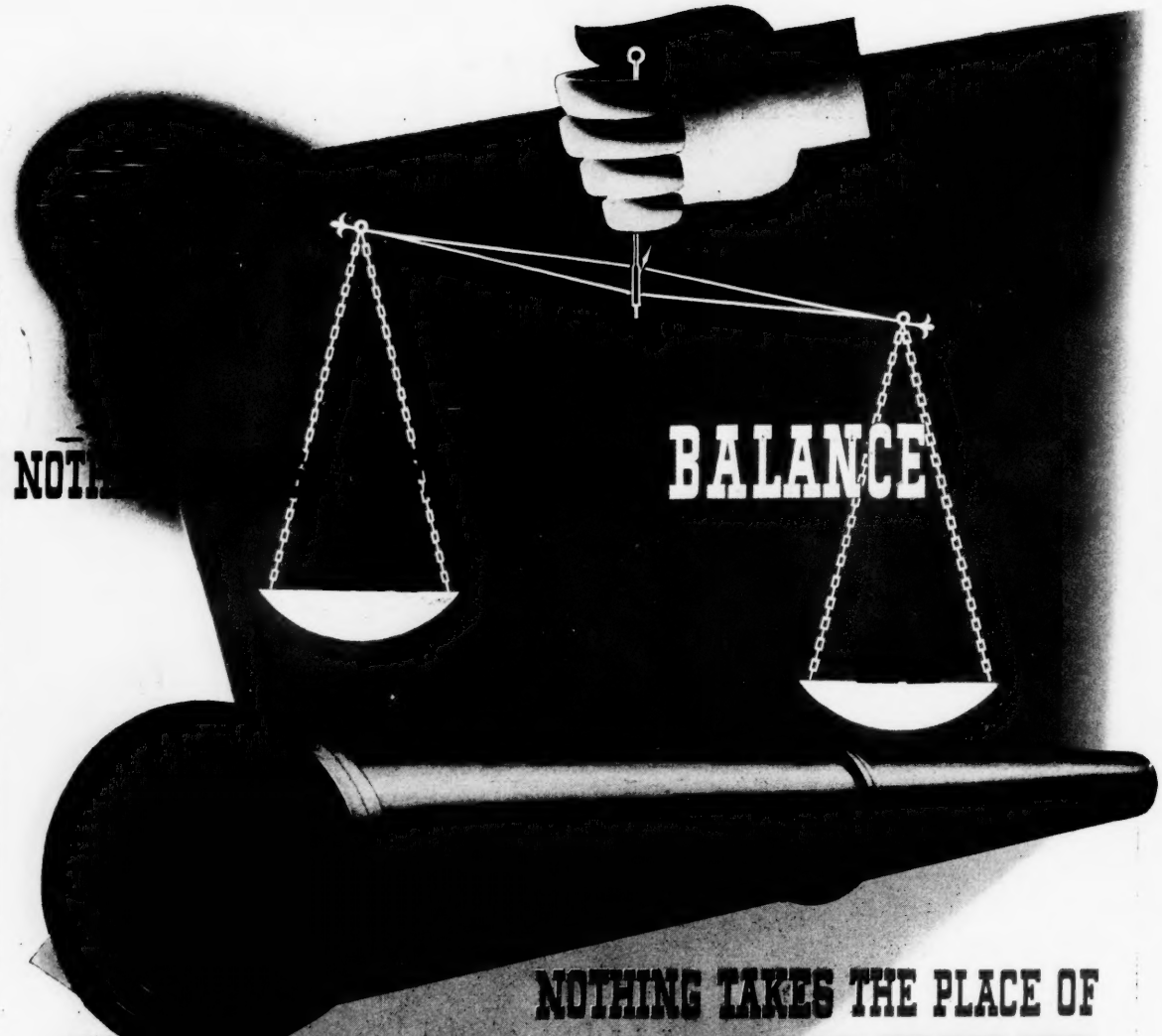
An experienced Gulf engineer, thoroughly familiar with today's problems of mill operation, is ready to give you intelligent lubrication counsel which will be of real dollar-and-cents value to you. Why not take advantage of this money-saving service at once?

GULF INDUSTRIAL LUBRICATION

Listen to the new Gulf radio program—THE PASSING PARADE, with John Booth Nesbit—every Sunday evening, Columbia network.

Gulf Oil Corporation • Gulf Refining Company

GENERAL OFFICES: GULF BUILDING, PITTSBURGH, PA.



NOTHING TAKES THE PLACE OF CAST IRON PIPE

THE STANDARD MATERIAL FOR UNDERGROUND MAINS

Recent installation of 30-inch cement-lined cast iron pipe at Washington, D. C. for District of Columbia Water Department.

FOR weighing, nothing since biblical days has supplanted the beam balance with two scale pans. For underground mains the standard material today, as for two centuries, is long-lived, economical cast iron pipe.

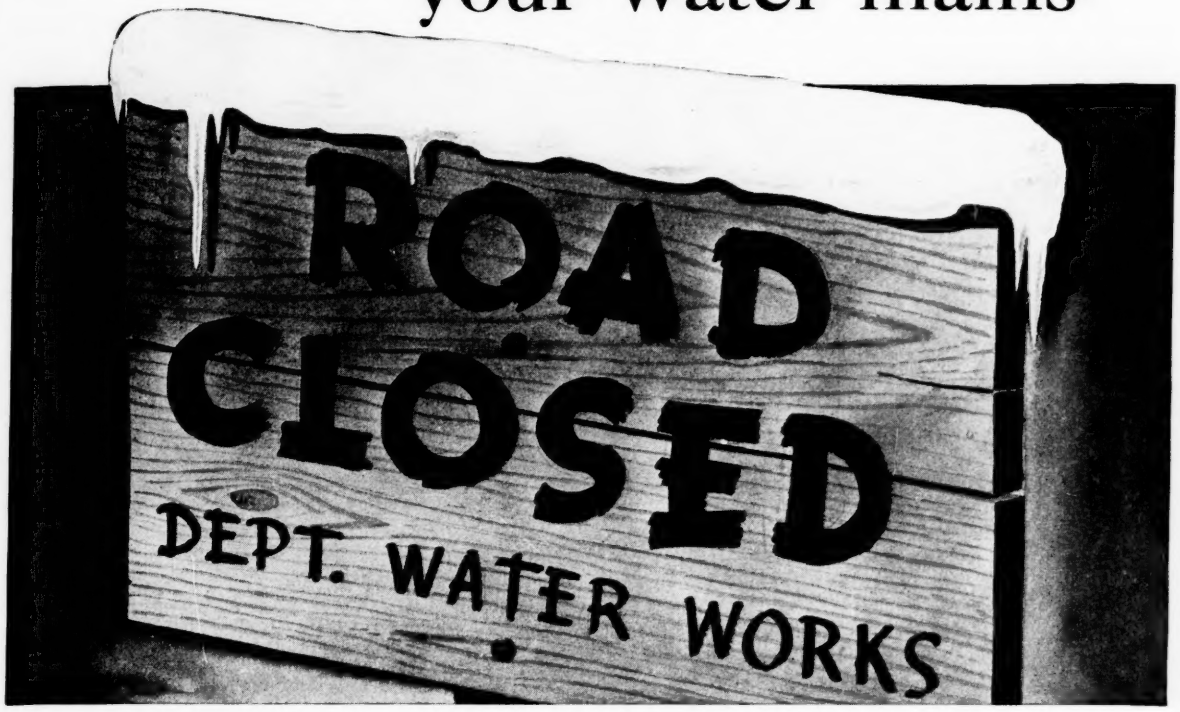
If you want long life and low maintenance cost that result from effective resistance to corrosion—assured safety margins for impact, beam load and crushing stresses—and permanently tight joints—then you will agree that nothing takes the place of cast iron pipe. Some materials meet some of these requirements but only cast iron pipe meets them all.

Look for the "Q-Check" registered trade mark. Cast iron pipe is made in diameters from 1¼ to 84 inches.

CAST Q IRON

THE CAST IRON PIPE RESEARCH ASSOCIATION, THOMAS F. WOLFE, RESEARCH ENGINEER, 1015 PEOPLES GAS BUILDING, CHICAGO, ILLINOIS

How to "*Winterproof*" your water mains



"OLD MAN WINTER" has long been a bugaboo to waterworks engineers. For just as soon as temperatures drop below freezing, and subsoils freeze, the number of breaks in friable water mains has always gone up by leaps and bounds.

The reason for this is no mystery—it is simply a matter of the difference between frozen and unfrozen soil. Unfrozen earth has a cushioning effect that damps out surface vibrations. Frozen earth is rigid and hard, transmits vibrations to considerable depths. And if there is a water main below, it must be able to withstand vibration successfully, or the result is often a broken main.

But "Old Man Winter" is no match for NATIONAL Steel Pipe. For this pipe, made from high-grade steel, is flexible and resilient. Heavy traffic vibrations have no effect on it, winter or summer.

This is only one of the ways NATIONAL Steel Pipe saves your system money. Since it comes in longer lengths, it requires fewer joints, costs less to lay, and gives you a more dependable main. Where corrosion is a factor you have a wide selection of surface coatings from which to choose—which will adapt the pipe to practically any soil condition. Moreover, the extra tensile strength of steel is a worth-while asset wherever high water pressures are involved.

For trustworthy water mains, insist on NATIONAL Steel Pipe. Low laying costs and freedom from troublesome breaks will reflect credit on your judgment. It gives you the most service per dollar of cost—the greatest safety that money can buy. And your city will receive the benefit of thoroughly dependable water service.

FOLLOW THE TREND TO NATIONAL STEEL PIPE Because it:

1. Offers greater all-round reliability.
2. Has low friction loss . . . greater carrying capacity.
3. Eliminates risk of sudden fractures.
4. Saves money on repair bills.
5. Helps keep streets open for traffic.
6. Withstands higher pressures.

NATIONAL TUBE COMPANY

PITTSBURGH, PA.

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* · United States Steel Products Company, New York, *Export Distributors*

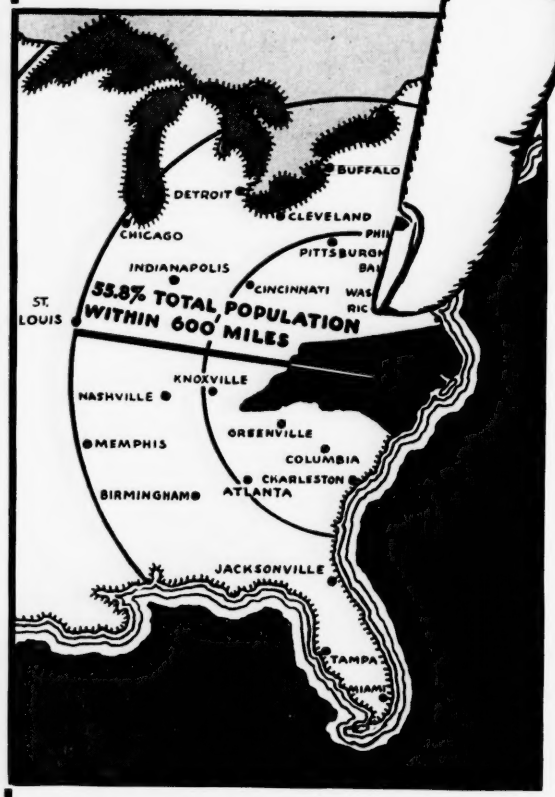
UNITED STATES STEEL

HERE...

REDUCE COSTS

of manufacture
and distribution
of

YOUR PRODUCT



OUTSIDE THE CONGESTED AREAS . . .
YET CLOSE TO THE RICHEST MARKETS

North Carolina is logical for the location of your plant for many excellent reasons. To begin with, it is one of the oldest industrial States in the Union. Industry thrives here where the laws and tax policies are progressive and constructive to business. The climate is moderate the year round, hence less investment is required in factory buildings . . . less for fuel. Workers, nearly 100% native-born, are friendly, intelligent and ambitious to deliver a day's work for a day's pay.

The State is rich in raw materials, and its power supply is both adequate and economical. Here you have the geographical advantage of being within 600 miles of over half the country's population—yet without congestion. Its splendid system of paved highways, rail and water shipping facilities aid economical distribution to these nearby consuming markets. At your request, an analysis will be made of the profit opportunities here for *your* business.

Write Industrial Division, Room 106, Department of Conservation & Development, Raleigh.

North CAROLINA

HOME OF SUCCESSFUL INDUSTRY

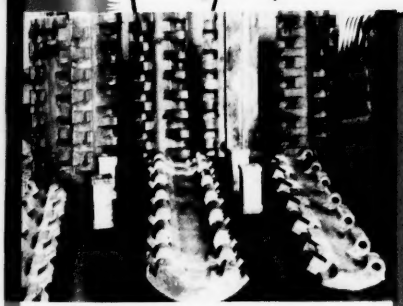
HAVE YOU EVER IMAGINED A BRONZE LIKE THIS?

D-H-S BRONZE
SAND CAST . . . WITHOUT HEAT TREATMENT
ACTUAL PHYSICAL PROPERTIES

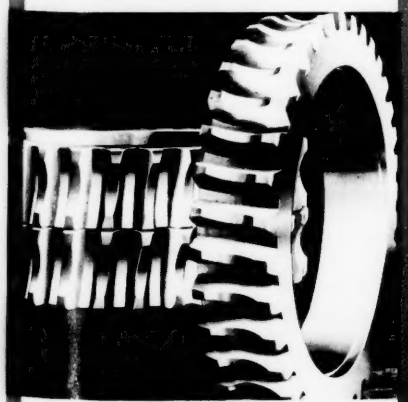
Ultimate Tensile Strength (lbs. per square inch)	135,650
Yield Point (lbs. per square inch)	110,150
Elastic Limit (lbs. per square inch)	78,500
Elongation—per cent in two inches	17-18
Reduction of Area—per cent	17-20
Brinell Hardness No.	255
Yield Point in Compression (lbs. per square inch)	90,000
Permanent Set under 100,000 lbs. per square inch—inches	.0095

Note: Recommended for applications where lineal contact speeds do not exceed 250 feet per minute.

Available Rolled, forged or cast in four grades of varying combinations of physical properties



D-H-S No. 2 Bronze Swinging Segments; weight 1100 to 1800 lbs. each.



D-H-S No. 2 Bronze Worm Gears, each 56½" OD x 10" face. Weight 3400 lbs. More than 200 such gears have been furnished in the past year.

D-H-S BRONZE IS HELPING OTHERS
. . . What Can It Do For You?

Designers in almost every field have found D-H-S Bronze the ideal material for many difficult problems. Stronger in tension and more resistant in compression than any other non-ferrous alloy, it yet is ductile. Excellent for pressure-tight applications, it is economical, since it costs less (11 to 13% lighter than any red metal or nickel bronze) and serves better in many applications than stainless steel, other non-ferrous nickel alloys, and aluminum bronze. D-H-S Bronze possesses a remarkable combination of Ductility, Hardness and Strength, making it particularly desirable for heavy duty applications. Engineers everywhere are finding new uses for D-H-S. You, too, may find it a solution for difficult problems.

Other Available Alloys

NON-FERROUS ALLOYS

Manganese Bronze
Aluminum Bronze
Nickel Bronze
Silicon Bronze
Phosphor Bronze
Bearing Bronzes
Hydraulic Bronzes
Specification Bronzes
Federal—S.A.E.—A.S.T.M.

FERROUS ALLOYS

Gray Iron
Semi-Steel
High-Test Iron

KOPPERS COMPANY
BARTLETT HAYWARD DIVISION · BALTIMORE, MD.

D-H-S BRONZE

DUCTILITY · HARDNESS · STRENGTH

a KOPPERS product

1. Coal Tar Pitch Roofing
2. Waterproofing and Dampproofing
3. Pressure-treated Piling, Poles, Posts, Structural Timber, Ties, etc.
4. Coal
5. Coke
6. Gas
7. Fast's Self-aligning Couplings
8. American Hammered Piston Rings
9. Locomotive Cylinder Packing
10. D-H-S Bronze
11. Iron Castings
12. Tanks, Tank Work, Flate Work
13. Pipe
14. Materials-handling Equipment
15. WESTERN Fire Hydrants
16. Valves and Sluice Gates
17. Waste Heat Boilers
18. Bituminous-base Paints
19. Lumino Bituminous-base Aluminum Paint
20. Tarmac for Paving
21. Disinfectants, Insecticides, Deodorants
22. Tar Acids
23. Light Oils
24. Naphthalene
25. Repair, Rebuilding, Reconditioning of Bay, Coastwise and Ocean Vessels
26. WESTERN Automatic Time Cycle Controls

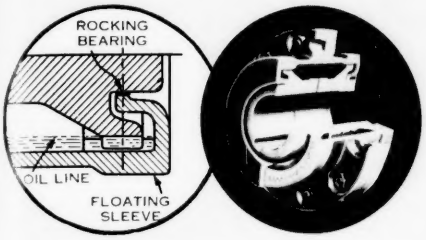
TANK AND PLATE WORK, PIPE . . . (Below) Koppers has modern structural shops equipped for the fabrication of high and low pressure gas holders, storage tanks of all sizes, pipe and pipe fittings and a wide variety of steel plate work.

ROOFING . . . (Above) Most of the spectacular records for long life in roofs have been made by coal tar pitch. Koppers is one of the principal manufacturers of coal tar roofing. Send for the Koppers Roofing book.

COAL . . . Koppers entered the coal business to get an assured supply of high-quality coals for its coke and gas plants. Today it has 25 mines with 15,000,000-ton annual capacity of 12 different kinds of coal and rigidly controlled quality standards. Koppers Coals for every purpose are available to you.

IN HOW MANY OF THESE PLACES DO YOU USE KOPPERS PRODUCTS?

FAST'S COUPLINGS . . . Koppers produces the genuine Fast's Self-aligning Couplings. The load-carrying surfaces of these couplings are protected from wear by a positive film of oil. This oil is kept permanently clean by the rocking bearings which make precise metal-to-metal contact and are in the one position where they form permanent dust and moisture proof seals. These vital features are found only in genuine Fast's Self-aligning Couplings.



PRESSURE-TREATED WOOD . . . Substitutes for wood are used in many structural projects on the assumption that they are more permanent . . . but properly pressure-treated timber products have proved that long life is obtained with wood. Pressure-treated wood can be supplied by The Wood Preserving Corporation, a Koppers subsidiary, treated with either creosote or salt solutions.

KOPPERS DIVISIONS, SUBSIDIARIES AND AFFILIATES

American Hammered Piston Ring Division · Bartlett Hayward Division · Boston Tow Boat Company · Eastern Gas and Fuel Associates · Engineering and Construction Division · Gas and Coke Division · The Koppers Coal Company · · · Koppers-Rheolaveur Company · The Maryland Drydock Company · Mystic Iron Works · Mystic Steamship Company · National Lumber & Creosoting Company · New England Coal & Coke Company · Tar and Chemical Division · Western Gas Division · The White Tar Company of New Jersey, Inc. · The Wood Preserving Corporation.

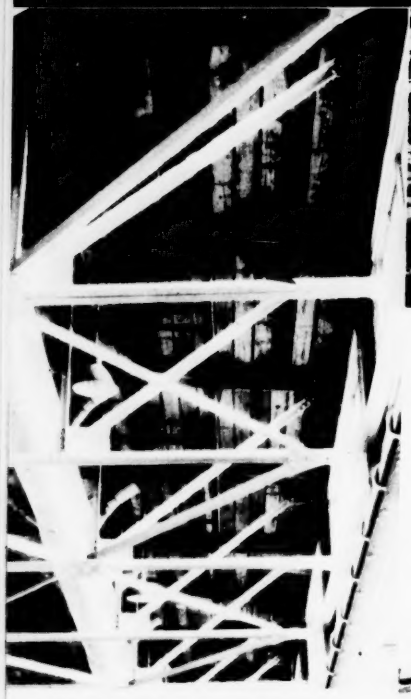
KOPPERS

Drawn for Koppers Company by Alex Ross

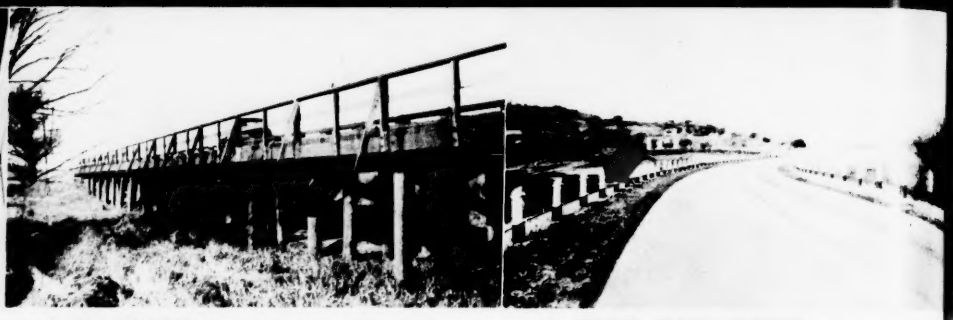
to banish maintenance

BUILD WITH TIMBER PRODUCTS

Repairs . . . replacements . . . painting . . . these are hidden leaks which eat away at profits of private industries and exhaust appropriations in the field of government. In many cases, it has been possible to eliminate these losses by the use of pressure-creosoted timber.



1. ROOF REPLACEMENT POSTPONED. In factories where there is great humidity or destructive fumes, the life of roofing has been tripled by the use of pressure-treated timber. The Wood Preserving Corporation can supply either creosoted or salt-treated timber for this purpose.



2. NO UP-KEEP. The pressure-creosoted timber in this bridge has been in use since 1922 without maintenance costs of any kind. It not only eliminated painting and repair work . . . it saved $42,500 on original cost of construction.

3. FEWER POSTS BROKEN. Much of the breakage of untreated guard rail posts can be traced to weakening of the posts at the ground line. This does not occur in pressure-creosoted guard rail posts.

4. MECHANICAL WEAR REDUCED. On floors, piers, walkways, bridges, pipe racks and other places where timber or lumber is subjected to service wear, pressure-creosoted timber lasts longer and postpones need for replacements. The preservatives protect all the fibers of the wood.

5. YEARS OF ADDED LIFE. Steps, walks, building sills, foundation timbers and other structural wood which is to be in direct contact with the ground will last years longer if they are pressure treated with creosote.

OTHER PRODUCTS AND USES FOR PRESSURE-TREATED TIMBER

6. Buildings, Bins, Sheds . . . 7. Piling . . . 8. Ties . . . 9. Tanks, Sumps, Vats . . . 10. Barges . . . 11. Conduits . . . 12. Cribbing . . . 13. Culverts . . . 14. Flumes . . . 15. Poles . . . 16. Posts . . . 17. Trench Lining and Covers . . . 18. Fences

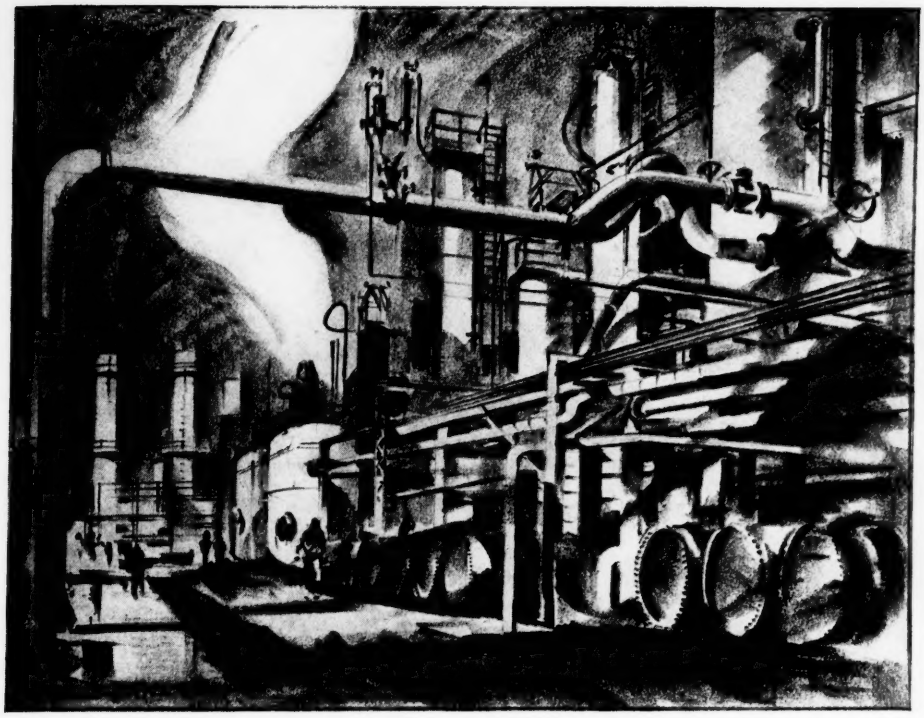
OTHER KOPPERS PRODUCTS

Roofing . . . Waterproofing . . . Bituminous Paints . . . American Hammered Piston Rings . . . Fast's Self-aligning Couplings . . . Plate Work . . . Tanks . . . Castings . . . Valves . . . WESTERN Fire Hydrants . . . Tarmac Road Materials . . . Coal . . . Coke . . . Disinfectants . . . Tar Acids . . . Light Oils

THE WOOD PRESERVING CORPORATION

PITTSBURGH, PA.

KOPPERS *subsidiaries*



In the Shell Petroleum Corporation's Deer Park Refinery on the Houston Ship Channel.
—from a lithograph

FINANCIAL AMERICA Knows the Story of EXPANDING INDUSTRY on the TEXAS COAST

The men who guide the policies of industrial America—financiers, directors of great corporations, consulting engineers—are well aware of the industrial importance of the Texas Coast Country. Their knowledge of the resources, the opportunities, the considerable industrial development on the Texas Coast has been gained at first hand: during the past several years, the coast country has played host to a long list of distinguished visitors who came, saw, listened and took away with them the facts upon which important decisions to expand or decentralize southwestward have been based.

Here, in brief, is what our visitors have learned: *whatever industrial advantages are offered by any other region, you can find—with other, added advantages—on the Texas coast.*

If your problem is raw materials for manufacture, note the variety of industrial resources utilized by coast country industries. If it's markets, consider the breadth and richness of the market, foreign and domestic, supplied by industrial Texas. If it's fuel, the coast country's unlimited supply of natural gas will solve your difficulty. So it goes.

Good business judgment dictates that you thoroughly investigate the Texas Coast Country as an industrial location. To assist you, we offer you, without cost or obligation, the strictly confidential, individualized Survey Service of our Research Department. Each survey is specially prepared to furnish the interested industry with a factual, detailed, engineered report. To secure a survey for your company, outline your needs in a confidential letter addressed to the Houston Pipe Line Company, Petroleum Building, Houston, Texas.

Petroleum refining is Texas' leading manufacturing industry, producing manufactured products valued at approximately $438,000,000 per year. The Shell Petroleum Corporation's Deer Park Refinery on the Houston Ship Channel is a major unit of this industrial activity. Located on 800 acres, it has a capacity of 76,000 barrels of crude oil daily, and employs 1200 men.

HOUSTON PIPE LINE CO.
Subsidiary of Houston Oil Company of Texas
GEO. A. HILL, JR., President
Wholesalers of Natural GAS

WHY DON'T YOU DRIVE A 1918 AUTOMOBILE?

INDUSTRIAL light and power generation and methods of use have come on many a change in twenty years.

How far would you get today putting dependence on a 20-year old truck - - - or selling your family on a 1918 sedan?

In some cases, old industrial facilities are as far out of the picture as those 1918 models. And business men know what that means when measured by *ability to do the job.*

That's why the light, heat and power facilities of your electric company go farther and farther ahead of the problems, responsibilities and cost liabilities of isolated industrial sources.

While time marches on, he lays a heavy hand on the efficiency and limitations of private industrial power plants . . . but your utility industry, enlisted in your service, keeps step with time, to bring you the benefits of the advances in the arts of the service.

THE COMPANIES *in this system maintain for the benefit of their customers a personnel of experienced power, heating and lighting engineers . . . for co-operation in all matters looking to improving customers' operations through use of the companies' services.*

THE COMMONWEALTH & SOUTHERN CORPORATION

ALABAMA - FLORIDA - GEORGIA - ILLINOIS - INDIANA - MICHIGAN - MISSISSIPPI - OHIO - PENNSYLVANIA - SO. CAROLINA - TENNESSEE

99 9,996,551/10,000,000% OF CRANE SCREWED FITTINGS ARE FOUND FIT

Last year, out of the millions upon millions of Crane screwed fittings sold, only one in every 290,000 was reported unusable. Striking proof that—in fittings as in valves—

IT'S WHAT'S INSIDE THAT COUNTS!

CRANE

VALVES • FITTINGS • PIPE
PLUMBING • HEATING • PUMPS

CRANE CO., GENERAL OFFICES: 836 S. MICHIGAN AVE., CHICAGO, ILLINOIS

NATION-WIDE SERVICE THROUGH BRANCHES AND WHOLESALERS IN ALL MARKETS

CRANE SCREWED FITTINGS FOR POWER PLANTS AND FACTORIES

Crane's line of fittings includes not merely the few hundred types and sizes in most common use, but a total of more than 10,000 separate and distinct items in cast and malleable iron.

ELBOWS—90°, 67½°, 60°, 45°, 30°, 22½°, 11¼°, and 5⅝°, Street, Long Sweep, Side Outlet, Drop, Hub Vent

TEES—Service, Four-Way, Drop Tees, Long Sweep, Double Sweep, Wash Tray

COUPLINGS—Right Hand, Right and Left, Half (Also Wrought Iron), Reducers, Increasers

BUSHINGS—Outside and Inside Hexagon, Face, Eccentric, Double Tapped

PLUGS—Square Head, Solid, Countersunk, Bar, Barrel

NIPPLES—Close, Short, Long, Tank

UNIONS—Ground Joint, Gasket Type, Female, Male and Female, Air-Pump

UNION FITTINGS—Male and Female, 90° and 45° Elbows, Tees with Union on Run or Outlet

A CRANE FITTING FOR EVERY PURPOSE—The screwed fittings shown above are only a few of the scores of different types and modifications. The complete Crane line includes banded and plain patterns, black or galvanized, in a wide range of straight and reducing sizes; in four pressure classes in malleable iron and five in cast iron.

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WHY NOT GIVE ALL THE FACTS

A SHORT time ago there was published a report of the National Resources Committee on "Consumer Incomes in the United States." Before it was available to the public, one part of it was made a feature in newspapers throughout the country, emphasizing that the average income of the South was lower than that of the rest of the nation. Why this was selected for prominence before the report was issued is not known.

This followed the previous declaration of the President, supported by the Committee of the National Emergency Council, that the South presented the No. 1 economic problem of the nation.

There are reasons that are perfectly understanbable why the average income of the South is slightly less than in other parts of the country, but that does not prove, when the facts are examined, that an economic problem, No. 1 or any other number, is presented. As a matter of fact, the National Resources Committee qualifies its statement about the lower income of the South by saying: "It must be remembered in interpreting these differences that the averages are affected by the concentration of very high incomes among families living in large cities, and these cities are more numerous in the New England, North Central and Pacific states. It must also be borne in mind that the averages for the South are weighted by a relatively large proportion of farm families. Furthermore, it should be recalled that costs of living differ from one part of the country to another."

The only kind of income accounted for in the report is cash income, so that "the weighting of the average by a relatively large proportion of farm families" raising their own food supplies in the South are not counted in the computation made.

Federal expenditures for all purposes up to date under the present administration has been, in the South, a little more than half the amount per capita that it has been in the rest of the country—$180 compared with $332. If the South is in the deplorable condition it is supposed to be in, either government benevolence has not taken proper account of it, or it is believed, instead of being an economic problem, its living costs are so much less that it does not need the money. The Southern state receiving the highest per capita average of Federal funds ranked 24th among states of the Union.

The WPA Department of the government admittedly bases its rate of pay of workers on actual living costs. In no Southern state does the average pay of such workers exceed 40 cents per hour. This is the minimum rate in every Northern state, while the average in the North is 25 to 50 per cent higher than the highest average in the South. In cities of the North, WPA workers are paid nearly double the highest rate paid in the South.

The Department of Labor's figures of living costs in textile towns in New England and comparable textile towns in the South show the amount expended for rent in the South for the average family is 46 per cent of the amount paid in New England. General living expenses are 20 per cent less than for the average New England family.

As to the matter of actual cash income, the percentage of families in the South, according to a government survey made public less than a year ago, with incomes ranging from $1 to $1,499, was only 3 per cent greater than that for the rest of the country, and furthermore that among families classed as with "no income" the South showed 3.3 per cent of such families compared with 4.8 per cent for the balance of the country.

The Department of Agriculture states that

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the average income in two cities of industrial New England is $1,347, and in two comparable Southeastern cities the average income is $1,252.

Whatever may be the difference in incomes, and it is not very great, it is far from proving the South a region of economic degeneracy and an economic problem of the nation. Such statements, as we have said before, take no account of the marvelous progress the South has made since the Civil War, nor of actual present conditions.

The MANUFACTURERS RECORD expects, in its November issue, to present a summarization of markets of the South showing what the South spends for the principal commodities of commerce.

What About Cotton

EXPORTS of United States cotton in August totaled 200,851 bales compared with 220,000 bales for the corresponding month last year. Declines of exports to individual countries in some cases exceeded 50 per cent. Canada and Japan were the only two countries that bought more of our cotton than they did the year before.

These facts, taken in connection with the decline in dollar value, are significant and direct attention sharply to what may be the course of American cotton both here and abroad under present circumstances as a world commodity. What will happen to it in the future? Irrespective of the question of a high or low tariff, on which there are honest differences of opinion, when it is considered that in place of a crop formerly exported to the extent of 60 per cent of the amount grown in this country, being our principal export commodity, and in addition being the crop of the largest dollar value, there are at least three things which stand out as obvious.

There must be undiminished and additional efforts to find new outlets for cotton consumption. The quality and staple length of the cotton we grow must be improved; campaigns of education and demonstration must bring this home to every farmer in the South. And more acres must be diverted from cotton growing to other use. Intensive cultivation with selected seed on smaller acreages is imperative.

We are among those who believe that pegging the price of cotton above world prices was a boon to foreign growers and not to America. While foreign acreage this year probably will be less than last year, there is a carry-over of foreign cotton amounting to 10,000,000 bales, which far exceeds that of any previous year and will act as an additional bearish factor on the market. In other words, foreign growers saw a chance to step in as long as we wanted higher prices than the world was willing to pay, and they took advantage of the opportunity. The only way apparently we can meet that competition in the future will be by a better article or a lower price.

The U. S. crop for the current year, though about 37 per cent less than last year, is estimated at approximately 12,000,000 bales. This, together with the August 1 carry-over, which is greater than any previous carry-over, brings the total supply of American cotton to 25,250,000 bales or two per cent more than the available supply of last year. The average yield per acre, estimated at almost 218 pounds, though nearly 50 pounds less than the 1937 average, is with that exception the highest since 1898, yet the total area under cultivation consisting of 26,347,000 acres is smaller than any season's acreage since 1900.

The production of foreign cotton possibly will be less than last year but on the other hand the carry-over as stated of foreign cotton this year, amounting to 10,000,000 bales, far exceeds that of any previous year and undoubtedly will bring the total world supply to something over 50,000,000 bales as was estimateted by the MANUFACTURERS RECORD in the June issue. At the same time cotton consumption both in this and foreign countries, which was accelerated in July and August though still less than the corresponding period of 1937, started to decline in the early days of September as the international tension increased.

The MANUFACTURERS RECORD has consistently held for years that the South has given more attention to cotton and less attention to other desirable and profitable crops than circumstances justified. Diversification recently has been more widely practiced. With its soil and climate, every section of the South should be independent of other sections of the country for its food supplies. It can raise better crops and more crops on an acre of land than other sections can raise them. Its farming population can grow into independence more quickly by growing less cotton and improving its quality while giving attention to other necessary grains, dairy and meat products than by re-

maining tied to the stake of cotton and cotton alone.

Here is where the banks and lending agencies of the South can do a valuable work in helping energetic farmers in a course that will not only pay them individually, but benefit the entire section.

A Better Understanding of Business

THE MANUFACTURERS RECORD believes that industry can do no better work than to direct its advertising and publicity efforts to the building of good-will. T. M. Girdler, Chairman of Republic Steel Co., expressed a similar opinion in an address at Cleveland recently, in which also he said that a great deal of New Deal thinking ran to the control of government over industry.

Mr. Girdler did not agree with the thought that business opposes reforms if such reforms benefit the general welfare. On the contrary, such reforms are welcomed by business because of its realization that sales volumes improve with mass purchasing power. Impulsive reforms, however, not carefully thought out serve to create new evils.

The Atlantic & Pacific Tea Company, operating more than 11,000 stores in 39 cities, recently employed advertisements in the newspapers to state its opposition to legislation proposed for the next session of Congress, which the company says will put chain stores out of business. It announces that this breaks a silence on public and private affairs extending over 79 years of business history, and explains that "it is faced with the necessity of deciding upon a course of action in relation to this proposed legislation—whether to do nothing and risk the possibility of the passage of the bill * * *, the dissolution of the business, or to engage in a campaign of opposition."

There is increasing realization by business men of the need of acquainting the general public with the vital part industry plays in the nation's welfare. This is finding expression through different organizations such as the National Industrial Information Committee, headed by Ernest T. Weir, which is sponsored by the National Association of Manufacturers "To Tell the People the Truth about American Industry."

As a motivating force in American life, advertising offers a way to bring about a better understanding of business. By utilizing it for this purpose commerce can be brought to a higher level of activity, but beyond that there will be a fuller understanding of the essential part business has played in the creation of new wealth and providing things essential to America's scale of living.

The view of the MANUFACTURERS RECORD concerning the injury done industry by the New Deal is well known. Industry, in putting before the people the facts of its accomplishments and the essential place it occupies in the economic affairs of the nation, may leave it to public judgment whether as a source of jobs and increasing the wealth of the country it should be encouraged or discouraged.

Industry must do more of its own work in developing markets and arousing the vast demand that has been dormant. The expression of this demand is necessary to employ the idle and bring the country back to prosperity. The needs of the country at present are being only half filled.

Fear has not only caused idle capital to hesitate about investing, but likewise has reduced sales in many cases to a point where producers have sometimes wondered if volume will ever get back to former proportions.

Recognizing fully, as this publication does, the handicaps which have affected business, and we have not been backward about pointing them out, we believe there is a great work for industry to do to benefit itself and the nation at large. The efforts of far-seeing men, which have been directed toward bringing to a wider audience the facts of what business has accomplished here, how much it has been responsible for the wellbeing of American citizens, deserves the fullest encouragement. Such efforts should be extended until the whole country is aware of the truth.

The trouble with reformers has been that they wanted to do their work without regard to its effects upon the producing agencies that created jobs. Reform was placed ahead of recovery, regardless of the consequences, and oftentimes without regard to the kind of reform or the necessity for it.

Wm. Bennett Munro, Ph.D. in "Personality in Politics," says: "Roscoe Conkling once remarked that when Dr. Johnson spoke of 'patriotism' as the last refuse of the scoundrel, he overlooked the vast possibilities that are latent in the word 'reform'."

Revealing the South's Material Resources

THE sixth map-article in our current series to show the commercially available natural resources of the sixteen Southern states from Maryland to Texas appears on the next four pages. Each state article presents data on manufacturing, agriculture, climate, power, labor conditions and taxation. The map locates by county all the important mineral deposits, large timber stands, transportation facilities and the larger centers of population. Each issue of the MANUFACTURERS RECORD since May of this year has contained one state survey and map: this month it is Louisiana and the remaining states will follow in alphabetical order.

By drawing attention to the South's vast resources and opportunities in this way, a new emphasis is given not only to the many advantages offered for plant locations but to the increasing number of sales and business opportunities immediately present throughout this area. The encouragement given to the establishment of new enterprises will enlarge the market for industrial products of every description and aid the industrial development of the country as a whole.

Many interesting facts not generally known even to Southerners have been uncovered and as the series unfolds, it will provide a valuable reference in graphic form of the salient facts about each Southern state. The map-articles are perforated so that they can be removed for separate filing and additional reprints of each article in the series is available when desired.

Attesting to the value of this series, Dr. George C. Branner, State Geologist and Director of Arkansas State Planning Board, says, "It seems to me that your presentation of basic material is of timely interest and much value as a picture of the available resources. Your policy of publishing these state summaries cannot be too highly commended as an aid to the industrial development of the South."

A Valuable Contribution

Your series of articles on the material resources and industrial opportunities in the South gives promise of being a valuable contribution to the cause of industrial development in this section of the nation.

Gov. R. W. Leche

Louisiana today is in the midst of a great commercial and industrial development program which has been remarkably successful in strengthening our economic structure and placing Louisiana on a self-sustaining basis.

At the outset of the recession which afflicted other sections of the nation, Louisiana created a Department of Commerce and Industry with authority to promote the civic, industrial and commercial interests of our state.

Although the program of the Department is but a little more than two years old, it has brought to Louisiana more than one hundred new manufacturing industries, or additions to existing industries, representing new investments in our state of more than $60,000,000. The construction of these factories has given permanent employment to approximately 20,000 persons in their operation, and the estimated annual payroll of these workers is $25,000,000.

Thus, Louisiana which for generations has been regarded as primarily an agricultural center, has been elevated to industrial leadership among the Southern states in the short span of two years through a policy of friendly cooperation between government and industry. It is our earnest belief that under this program of industrial development, Louisiana has fortified herself for all time against recession and that we will remain prosperous twelve months out of every year.

RICHARD W. LECHE,
Governor of Louisiana.

Serving the South

with a

BASIC COMMODITY

for nearly 40 years

●

"A GRADE FOR EVERY NEED"

MYLES SALT COMPANY, LTD.
NEW ORLEANS, LA.

The Wealth of Industrial Opportunities in Louisiana

LOUISIANA, sometimes referred to as "The Creole State," or "The Pelican State," dates its history from 1528 when Narvez, the Spanish explorer, discovered the mouth of the river Mississippi. In 1687, La Salle, who named the state for Louis XIV, made the first effort at colonization—an attempt which ended with his murder in Texas where he landed by mistake. In 1699, Iberville landed at what is now New Orleans but the colony was soon moved to Mobile. Ten years later another attempt was made and it, together with another venture in 1717 proved financially unsuccessful, but by this time a colony had been established which continued with little change until in 1762 France ceded the territory to Spain by the secret treaty of Fontainbleau. In 1800 Louisiana was re-ceded to France by another secret treaty and the fact became known only 20 days before the territory was purchased by the United States in 1803 for $15,000,000. In 1812 Louisiana was admitted to statehood in the Union.

Ranking 30th in size with 48,506 square miles of which 3,097 square miles are water area—the fourth largest water area of the Southern States, Louisiana had an estimated population of 2,903,000 in 1937 to rank 22nd among the states. Approximately one-third of the population are negroes.

Climate

EXTREMES of climate are virtually unknown in Louisiana. During the summer months there is little variation of temperature from the state average of 81° Fah. In the winter the average temperature ranges from approximately 56° Fah. in the south to 47° Fah. in the north.

The average annual precipitation is about 55 inches, the heaviest rainfall being in June, July and August while the minimum occurs in October and November. The remaining months are fairly constant with an average of 4½ inches.

Killing frosts seldom occur before the end of October and the last one is usually prior to the close of March.

Transportation

LOUISIANA possibly is unique among all the states in that its mileage of navigable waterways almost equals the mileage of railroads, there being close to 5,000 miles of each. In both instances, the state is adequately traversed with facilities affording transportation in practically every direction and particularly directed toward Baton Rouge and New Orleans where coastal and oceanic services are available to all parts of this and foreign countries. The value of merchandise imported and exported through Baton Rouge and New Orleans in 1937 was $144,231,937 and $217,479,737 respectively, making a total for the state, exclusive of the foreign trade passing through Lake Charles, which is classified in another customs district, of $361,711,674. New Orleans ranks second among the ports of the nation.

The highways of Louisiana comprising 12,100 miles, of which 2,250 miles are concrete, 1,150 miles are asphalt and 8,400 miles are gravel, provide a ready means of communication between the principal cities of the state and are serviced by 33 individual bus lines and 35 motor freight lines.

Commercial airlines operating across in the north and the south connect Louisiana with the metropolitan centers of the east and west while from New Orleans air transport makes direct contact with Chicago and all parts of the country.

Manufactures and Finance

THE value of Louisiana's manufactured products in 1935 amounted to $436,231,555 representing an increase of $4,056,192 over the 1933 total of $312,175,363. Outranking all other industries is that of petroleum refining with products valued at $82,441,397 and a payroll aggregating $5,857,866 for the 4,118 employees. Containers, materials, etc., represented a value of $67,830,238. Sugar refining ranked second with $58,073,148 and lumber and timber were third with $31,628,469. Other important industries with the value of their respective products are: paper, $22,309,369; rice cleaning and polishing, $17,709,755; fabricated textile products, $10,650,818; cottonseed products, $9,674,175; pulp, $9 680,269; and chemicals which exceeded $8,000,000.

The total cost of materials, containers, fuel, and purchased electric energy for all industries in 1935 was $290,619,763 while the wages of the 62,864 employees in the 1,622 establishments totaled $46,494,483.

Of the total internal revenue of $40,679,182, the federal income tax comprised $18,475,146 in 1937.

In the state's 146 banks, with capital stock of $27,103,000, reporting to the Comptroller of the Currency in 1937, aggregate resources were $468,960,000 and individual deposits $419,011,000. According to reporting exchanges the bank clearings totaled $2,119,888,000 in 1937 compared with $1,795,654,000 in 1936.

Agriculture

LOUISIANA is unique from an agricultural point of view as it is in several other aspects. Due to its climatic conditions and advantageous soils, it is possible to grow virtually any and every crop. In this respect Louisiana is able to supply foodstuffs for its own people as well as send large quantities to distant markets. In addition, the state grows large crops of products suitable for industrial purposes.

In 1937 the total cash farm income of $133,338,000 was comprised of $22,837,000 from livestock and livestock products and $103,323,000 from crops. The full significance of Louisiana's crops can be seen from the fact that only five other

Southern states derived a larger cash income from crops and yet there were only four states with a smaller crop acreage.

The most important crop is cotton and in 1937 the production of 1,104,000 bales yielded an income of $37,300,000 while the 491,000 tons of cottonseed added an extra $8,500,000. Among the other crops sugar cane is outstanding. Of the 6,291,000 tons of sugar cane produced in the United Statees in 1937, Louisiana contributed 5,516,000 tons and returned a cash income to the farmers of $17,350,000. Rice is another important crop, 21,262,000 tons yielding $13,900,000. Still other crops produced on a commercial scale and adaptable to industrial use are corn, sweet potatoes and peanuts while in St. James parish is grown the only Perique tobacco in the United States.

On the state's 170,216 farms are 2,513,000 cattle, sheep, swine, horses, and mules valued at $59,671,000. The total mortgage debt is $55,225,000 on 50,447 farms. The remainder of 119,769 are unencumbered.

Fisheries

WITH an abundance of both fresh and saltwater commercial varieties of fish, fisheries occupy an important position among Louisiana's industries. In 1937 saltwater fish production was 967,896 pounds valued at $96,704. To this must be added 76,217,825 pounds of shrimp valued at $2,667,624 and 3,261,582 bushels of oysters with a value of over $2,250,000. Fresh water fish in the amount of 11,678,841 pounds yielded almost $750,000.

Timber

ALTHOUGH the forest area of Louisiana, consisting of approximately 18,000,000 acres representing 56 per cent of the state's entire land area, is by no means the most extensive of the Southern States, its total stand of saw timber exceeds that of any other state by about five billion board feet. Louisiana is at an advantage in that the growth of trees in this region exceeds that of any other state in the nation.

According to the U. S. Southern Forest Survey, the volume of saw timber in the various species groups in Louisiana is nearly 29,500,000,000 board feet, 68 per cent of which is hardwood. The volume of cordwood amounts to more than 62,000,000 cords, made up of 12,500,000 cords of pine, almost 21,000,000 cords of pulping hardwoods, 26,000,000 cords of non-pulping hardwoods, and over 2,000,000 cords of cypress.

The total lumber sawed in 1936 was 1,249,798,000 board feet including 779,481,000 board feet of softwoods and 470,317,000 board feet of hardwoods. The variation between the two types of woods in consumption and timber stands is evidence of the industrial opportunity which the timber of Louisiana offers, particularly with regard to the pulp and paper industry.

According to the 1935 census, the value of lumber products was $31,628,000 in the state's 173 establishments. The cost of materials and power was $12,576,000 and the payroll, $9,150,000.

Spanish moss, which festoons the trees in a large area of the state's forests, yields an annual revenue approaching $3,000,000 and appears to exist in an inexhaustible supply.

Another of the state's forest industries is naval stores. The entire production of these commodities in the United States is confined to eight Southern States. In the season recently ended, Louisiana produced 2,065 50-gallon barrels of turpentine and 7,076 500-pound barrels of rosin.

Minerals

THE comparatively small variety of minerals produced in Louisiana at present is largely off-set by the available quantity and value. Since 1910 the value of minerals produced has increased approximately 15 times until in 1936 it reached $153,367,000. In 1937, 90,510,000 barrels of crude petroleum were produced while the quantity of natural gas produced in 1936 was in excess of 290 billion cubic feet. In the same year natural gas was the basis from which over 59,000,000 pounds of carbon black were produced. The remaining two minerals of outstanding importance are salt and sulphur, production of which was 974,403 tons and 429,602 tons, respectively, last year.

On the accompanying map are indicated, by parishes, those minerals which at present are commercially produced, but large as this output is, it is authoritatively stated that, minerologically, the surface has only been scratched. Of the 64 parishes, 45 are known present or potential producers of oil or gas. Many parishes produce both. Indications of Louisiana's mineral future are seen in the fact that a considerable number of the fields are centered in salt domes with oil, salt, sulphur, and limestone all being present.

Virtually all the state's mineral products are valuable not alone in themselves but as sources of numerous chemicals for an ever widening circle of industries.

Taxation

BY a vote of the electorate at the election in 1936 the State Constitution was amended so as to authorize the Governor, or the Board of Commerce and Industry with the Approval of the Governor, to enter into an agreement with the owners of any new industry to be established in the state or those making an addition to any industry already existing in the state, for the exemption from property or ad valorem taxation. Provision is made that no exemption shall be effective for a period longer than ten years from the date of contract.

State taxes generally applicable to corporations include a general property tax of 5.75 mills; a corporation tax of 1/20 of one percent of the amount of capital stock employed within the state with a minimum of $10 and a maximum of $2,500; a corporation franchise tax of $2 per $1,000 with a minimum of $10; and an income tax of four per cent on net taxable income —returns are not required for less than $3,000. In addition there exist severance taxes of varying rates according to specific resources, an organization tax, and special license taxes similar to those prevailing in most states.

The parish property tax is four mills. Assessment is based upon 100 per cent of value but this is liberally construed.

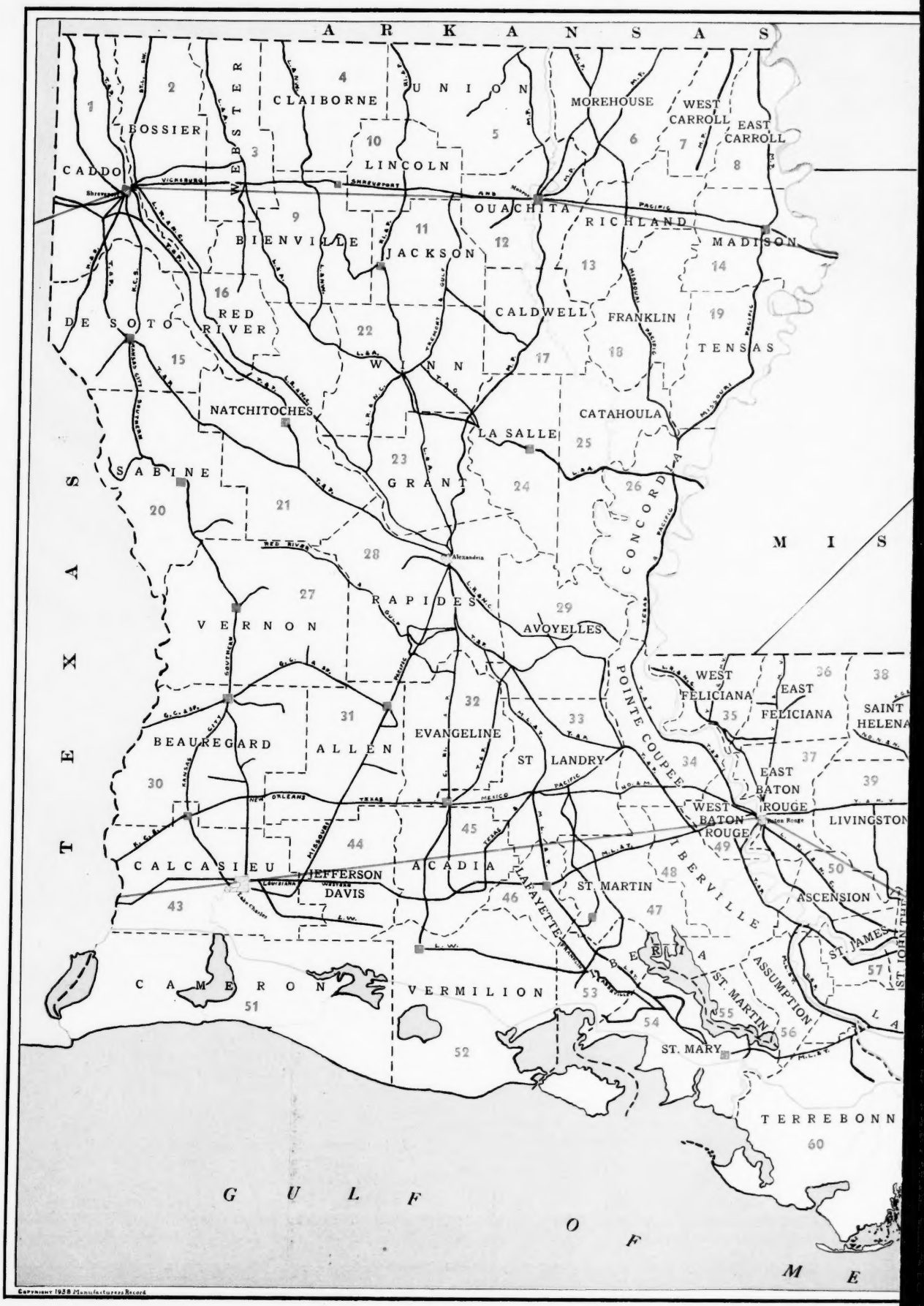
The assessed value of taxable property in the state in 1937 was $1,338,882,000.

Electric Power

ELECTRIC power facilities are available throughout the state and produced 1,668,391,000 kilowatt hours in 1937, all of which originated from fuel-operated plants since there are no hydroelectric plants.

The 60 plants operated by 36 companies include 11 steam power plants with a generator capacity of 291,080 kilowatts; 47 plants operated by internal combustion engines with a capacity of 21,442 kilowatts; and two combination plants developing 1,925 kilowatts.

In addition to the expansion of some of these plants which now is going forward, an adequate supply of power is assured by the network of transmission lines with interstate connections.



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LOUISIANA

Its principal raw materials and transportation facilities offering opportunities for industry, with additional facts on the reverse side pertaining to industry and its growth within the state.

Minerals

Parishes in which material is commercially produced

Carbon black—6, 12-13
Limestone—22, 32
Natural gas—1-10, 12-13, 15-16, 20, 28, 33, 13-15, 17-18, 50-55, 60-63
Oil—1-4, 10, 15-16, 20, 22-24, 28, 33, 13-15, 17-18, 50-55, 60-63
Salt—22, 48, 51, 53
Sand and gravel—1, 3, 5, 12, 23-25, 27-28, 32, 35-42, 53, 64
Shell—42-43, 51, 54, 59-62, 65
Sulphur—63

Timber

Cypress-tupelo—33, 39-40, 43, 47-48, 50, 53, 55-65
Longleaf—9, 20-24, 27-28, 30-32, 40-44
Shortleaf-loblolly-hardwood—1-6, 9-12, 15, 20-25
Loblolly-hardwoods—2, 4-6, 9, 11, 17, 20, 23-24, 27-28, 30-32, 35-40, 42-43, 45
Mixed bottomland hardwoods—1-3, 5-6, 12, 15-16, 20-23, 27-28, 30-31, 42-43
Oaks-mixed hardwoods—6-7, 12-13, 18, 32-33, 36-37, 50, 52-53
Red gum-mixed hardwoods—6-8, 14, 17, 19, 25-26, 28-29, 33-35, 37, 47-50, 54, 56-59

Naval stores—21, 27-28, 40-43

Agricultural products

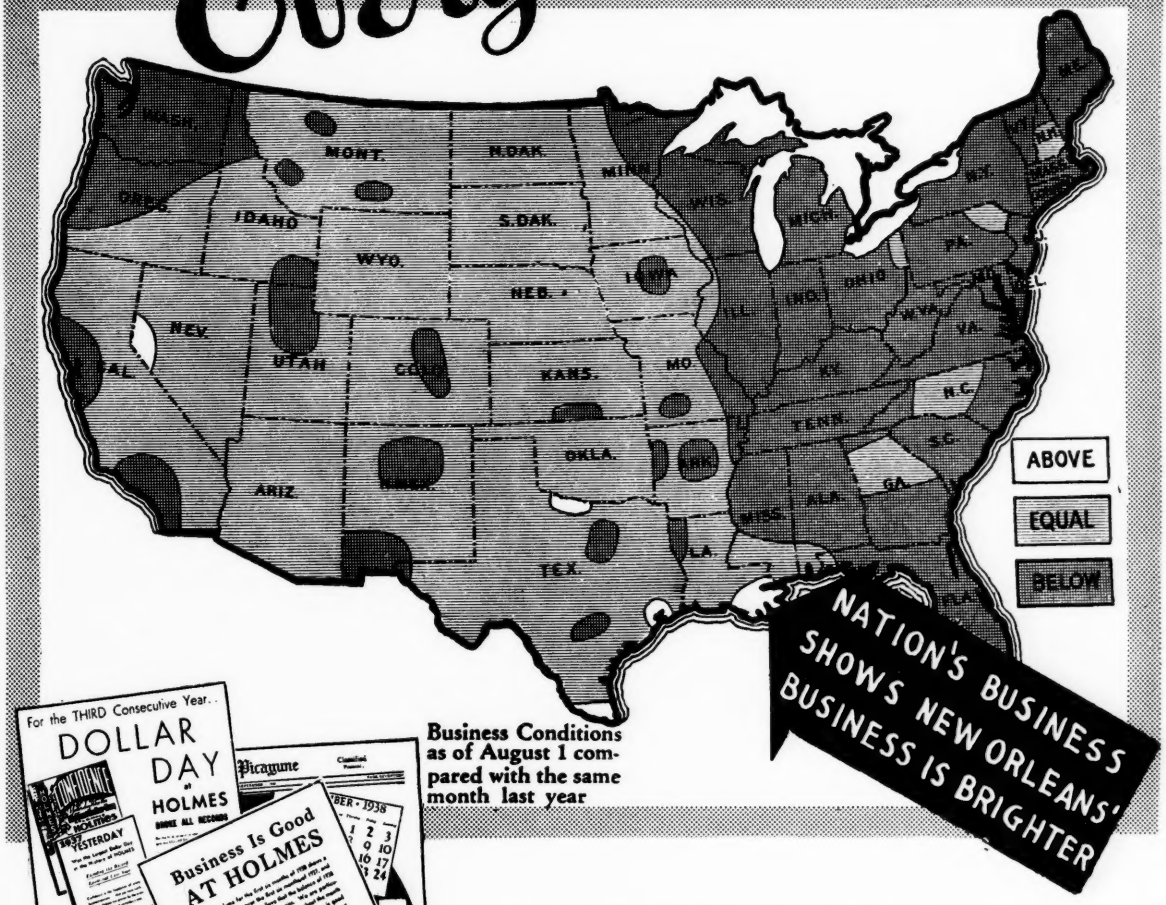
Cane sugar—28-29, 33, 35, 37, 46-50, 52-61
Corn—all parishes
Cotton—1-37, 40-41, 43-47, 52
Rice—31-35, 37, 43-53, 55-59, 62-63, 65
Sweet potatoes—28, 33, 35, 45-47
Tobacco (Perique)—57

Fisheries—51-54, 60-65

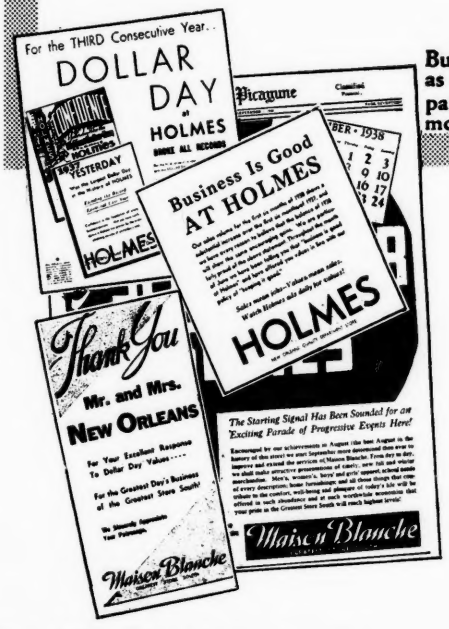
Natural gas is available for consumption in all parishes.

—— **Railroads**
Navigable waterways
—— **Airlines**
■ **Airports—also at principal cities printed in red**

Way Down Yonder in New Orleans Everything is Up



Business Conditions as of August 1 compared with the same month last year


For the THIRD Consecutive Year..
DOLLAR DAY at HOLMES
Business Is Good AT HOLMES
HOLMES
Thank You Mr. and Mrs. NEW ORLEANS
Maison Blanche

Two of New Orleans' leading department stores took paid space to proclaim their record-breaking '38 business. The Holmes store boasted substantial increases for the first six months of '38 and reported the biggest Dollar Day sales in their history. Maison Blanche reported the greatest single day's business in their history on Dollar Day and the highest August sales of all times. Yes, Sir! Everything is Up, down in New Orleans!

Down in New Orleans everything is up! Nation's Business highlights the New Orleans market as one of the nation's brighter business spots and local business men boast of breaking all-time business records. There was no recession in New Orleans and no summer slump . . . everything continues up down in New Orleans!

You can do more business in New Orleans by placing your advertising in The Times-Picayune New Orleans States where for the lowest milline rate you cover *both* metropolitan New Orleans and the prosperous Trade Area.

The Times-Picayune
NEW ORLEANS STATES

Representatives: NOEE. ROTHENBURG & JANN, Inc.
New York, Chicago, Detroit, Atlanta, San Francisco

"THE COMPASS OF PROGRESS AND OPPORTUNITY *now points to the South"*

The investor finds that the South has natural resources, power, transportation systems, climate, growing markets and other essentials of prosperity. Whether as a sales territory, a business location, or an investment field, Dixie has what it takes. The compass of progress and opportunity now points toward the South.

—BABSON'S REPORTS (JULY 18, 1938).

WE, THE GOVERNORS...

With a view to aiding industrial expansion of our section and the stabilization of employment, we, the Governors of the Southeastern States, set forth the following objectives: 1. Equitable freight-rates as affect the Southeast. 2. Uniform taxation policies. 3. Friendly labor attitude between employer and employee. 4. Cooperation with Federal Government on proper major policies affecting industrial development. It will be our aim by working together on these objectives to maintain conditions favorable to sound industrial development so that the Southeast will reap the full benefits of the ever-increasing trend toward Industrial Decentralization and gain a proper balance between Agriculture and Industry.

Southeastern Governors Conference

LAWRENCE WOOD ROBERT, JR., Executive Director, Bona Allen Bldg., Atlanta, Ga.

Unique Steel Making Laboratory

THROUGH use of a miniature steel plant, the first of its kind in the steel industry, a unique approach to research is being made in the new research and development laboratory of the Jones & Laughlin Steel Corporation, Pittsburgh.

Here, steel making facilities such as an open hearth furnace, heat treating furnaces and rolling mills of pilot plant size are used in conjunction with extensively equipped chemical, physical and metallographic laboratories in a direct approach to solving the problems of steel quality.

This pilot plant of small manufacturing units will be used to investigate, with complete technical control, the various methods of steel making on a basis that enables the ready application of new and improved practices in the big furnaces and mills of the production departments.

In the past, it has been the general practice to conduct research by a laboratory procedure which resulted in advancements being made in research faster than they could be tested and applied in the mills.

The J & L research and development department overcomes this handicap by combining the research laboratory with an assembly of development equipment to form this unusual laboratory in which steel making practices can be studied on a small scale resembling mill conditions so that when new or improved practices are turned over to the mills, they are certified to be commercially practicable. In addition, the staff is working to develop new designs for furnaces which give promise of bettering the quality of steel.

The laboratory is divided into several divisions. Projects are assigned to each division on the basis of the general fields of science or activity covered by that division such as physical metallurgy, process metallurgy, pilot plant operation, machine shop and testing, library and patent division and the service and clerical divisions.

The aim and scope of the research and development division determined that the department should be housed in a factory type building adjacent to the works. The central shop is flanked by offices and laboratories with adequate provision for future expansion. Electric power, compressed air, steam and other services are supplied from the mills nearby.

The type of equipment used in the new laboratory has been governed by the desire to give primary attention to the processes of steel making. A feature of this equipment is the small open hearth furnace which has a capacity of 1,500 pounds and parallels conditions in the big steel furnaces in the works. It is a recuperative and not a regenerative furnace, and is equipped with an unusual type burner. The new type of construction in this experimental furnace may be applicable to big furnaces used in actual production.

Ingots cast from this furnace weigh from 185 to 900 pounds as compared with ingots from commercial production which weigh from 3½ to 10 tons. The laboratory ingots are rolled in the pilot plant or, in some special cases, are rolled into various products on equipment in the regular mills.

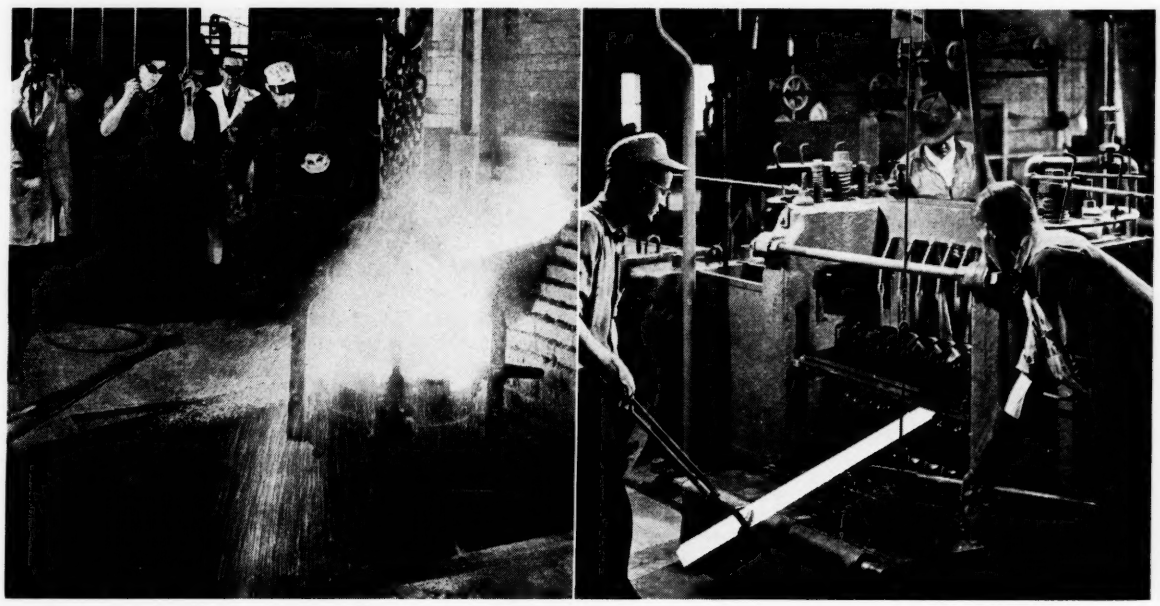
While conditions in the pilot plant do not always duplicate actual mill conditions, it is possible for the research staff to accurately determine in which phase discrepancies between pilot mill operations and commercial operations exist and thus not be misled in their conclusions.

In addition to the open hearth furnace, steel making facilities include a 375 pound electric arc furnace used for experiments on slags and steel making and a 30 pound electric induction furnace which affords the most exacting control over experimental steel making. A cupola is available to supply molten iron for a small Bessemer converter which will be constructed later. Both metal and slag analyses determinations of steel produced in the pilot plant are made in the chemical laboratory nearby.

Two rolling mills are used in the laboratory, one for primary reduction of

(*Continued on page 56*)

Left—Tapping the small open hearth furnace which has a capacity of 1,500 pounds. Right—From this three-high ten-inch mill emerges a bar which will be subjected to tests to determine its physical properties



Railroads Spend Over $30,000,000 Annually in Louisiana

LOUISIANA, with its extensive foreign trade activity, its important lumber and mining industries, its varied agricultural pursuits and its 1600-odd manufacturing enterprises, has a vital stake in adequate and efficient railway transportation. Moreover, a virile and progressive railway industry, when financially able to spend large sums for Louisiana products and Louisiana labor, is one of the state's greatest economic bulwarks.

The railway industry and the service it provides have been factors of major importance in the state's agricultural, industrial and commercial development. They are among the most constructive economic forces in the state today. Reaching out, fanwise, from New Orleans, the metropolis of Louisiana and one of the nation's leading seaports, and tapping the rich producing regions of the vast interior of the continent, these great steel arteries deliver to the busy wharves and docks of the Crescent City—for export to world markets—a never-ending stream of freight from farms, forests, mines and factories scattered throughout the Mississippi Valley and the Southern states.

The steamship lines and industries of New Orleans and the farms and mills of other Louisiana cities and towns send back to these regions in exchange vast quantities of sugar, coffee, fruits, vegetables, forest and petroleum products, and other imported and domestic commodities to supply the needs of millions of American people.

Railway transportation has vastly widened and increased the market for Louisiana products. Louisiana-grown sweet potatoes are shipped from coast to coast, and carloads of Louisiana vegetables are marketed in cities as far distant as Montreal, Winnipeg and Seattle.

The same is true with respect to the widespread distribution of forest products from more than 200 Louisiana mills and of many other Louisiana products which are dependent upon a nation-wide market.

However, railroads are more than agencies of transportation. They are great industrial enterprises. They rank among the leading buyers and consumers of fuel, materials and supplies. They are among the state's foremost employers of labor. The taxes they pay for the support of state, parish, city and town governments probably exceed those paid by any other industrial group in Louisiana.

Fifteen large railway companies and nineteen smaller railway companies are engaged in railway operations in Louisiana. These companies which serve the people of Louisiana directly operate—altogether, in all states—52,000 miles of railway lines (more than one-fifth of the total railway mileage of the United States), 5,196 miles of which are within the borders of Louisiana. In Louisiana alone there is enough railway mileage to span the continent, ocean to ocean, one and one-half times.

Aside from their thousands of miles of railway lines in Louisiana, the railroads own and operate locomotive and car repair plants, tie treating plants, supply depots, wharves and docks, warehouses, and numerous other facilities. In leading centers of railway activity—notably, New Orleans, Baton Rouge, Shreveport, Monroe, Alexandria, Lafayette and Minden—the rise and fall of railway expenditures are a highly important factor in measuring local prosperity.

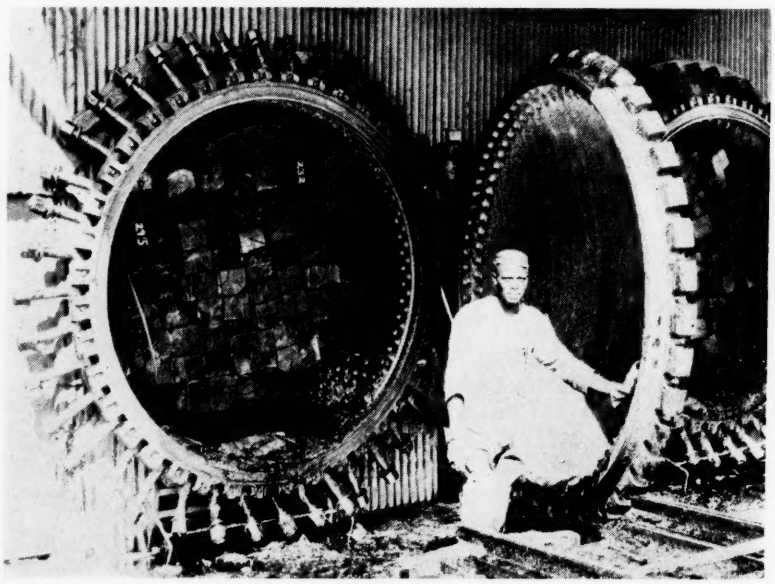
Railway dollars, however, reach into every part of Louisiana and the wide distribution of railway purchases is one of the most significant facts brought out in this series of articles on railway expenditures in Southern states. In Louisiana, the railroads reported purchases last year from thousands of firms in no fewer than 266 cities and towns. The railroads made purchases of fuel, materials and supplies in fifty-seven of the state's sixty-four parishes.

The railway shopping list in Louisiana consisted of a wide diversity of materials. It included yellow pine lumber, cross-ties, bridge timbers, poles, piling, turpentine, grain doors for freight cars, wood preservatives, gravel and shell for ballasting, sand, petroleum products, paint, oils, iron and steel products, brass castings, chemicals, gasoline, fuel oil, sea-foods, sugar, fruits, dairy products and other supplies for dining cars and restaurants, oxygen and acetylene, paper, alcohol, rubber goods, printing supplies, plumbing supplies, salt, ice, and many other items.

A recent analysis of railway expenditures by states in 1937 disclosed railway purchases from Louisiana firms by some, but not all, Class I railroads amounting to $9,477,000, and 1937 was a year of sub-normal railway buying. The foregoing figure does not include purchases made by any of the numerous Class II and Class III railroads (railroads having gross operating revenues of less than $1,000,000 annually), nor does its include purchases of switching and terminal companies, and such auxiliary companies as The Pullman Company, the Railway Express Agency and the several refrigerator car companies.

A recent survey conducted by the *Railway Age* discloses that railway purchases of Louisiana products are by no means confined to railroads which operate in the state. Of 100 railway companies filing returns in the survey, seventy-two re-

A trolley load of ties about to be treated in a wood preserving cylinder at the Illinois Central System's plant



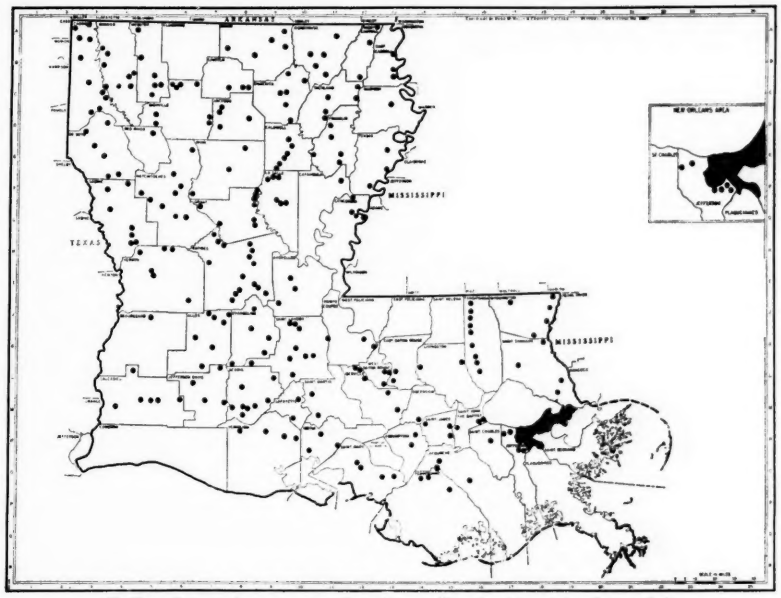
ported having made purchases in Louisiana in 1937. Of these, four were in New England, twelve in the Great Lakes region, twelve in the Central Eastern region, three in the Pocahontas coal region, fifteen in the Southern region, seven in the Northwestern region, ten in the Central Western region and nine in the Southwestern region. Of the seventy-two railroads which bought from Louisiana firms last year, thirteen operated lines in Louisiana and fifty-nine were non-resident railroads.

Louisiana's foremost industry, aside from agriculture, is the production of forest products. The railroads normally consume about one-fifth of the nation's output of lumber. Annual purchases by the railroads of Louisiana yellow pine rough and sawed lumber, poles, piling and cross-ties run into large figures, and this has the effect of providing employment to thousands of Louisiana workers. These purchases are not confined to the railroads operating in Louisiana. Many railroads in other parts of the country are among the buyers, and Louisiana yellow pine and cypress are extensively used in the construction and maintenance of bridges, trestles, freight cars and other railway structures from Maine to Montana, from Canada to the Gulf.

The importance of the railroads as buyers of Louisiana forest products may be gained from the fact that, notwithstanding a greatly reduced buying program, one railroad spent nearly $700,000 in the state last year for lumber. Another railroad reported purchases of around twenty million feet of Louisiana lumber last year.

Normally the railroads consume about one-fifth of all the fuel oil produced in the United States, and Louisiana is one of the principal centers of supply. Only fragmentary statistics are available, but an idea of the extent of these purchases may be gained from the fact that two railroads reported buying more than 2,000,000 barrels of fuel oil in Louisiana last year.

The railroads outrank every other industrial group in Louisiana as employers of labor. On July 1, 1937, the Class I railroads and The Pullman Company were providing employment to 14,400 Louisiana workers. With their families, they comprised a group equal to the populations of Lafayette, Hammond, Morgan City, Bastrop, Tallulah and Bogalusa combined.



Railroads purchase material and supplies in 266 cities located in 57 of Louisiana's 64 parishes

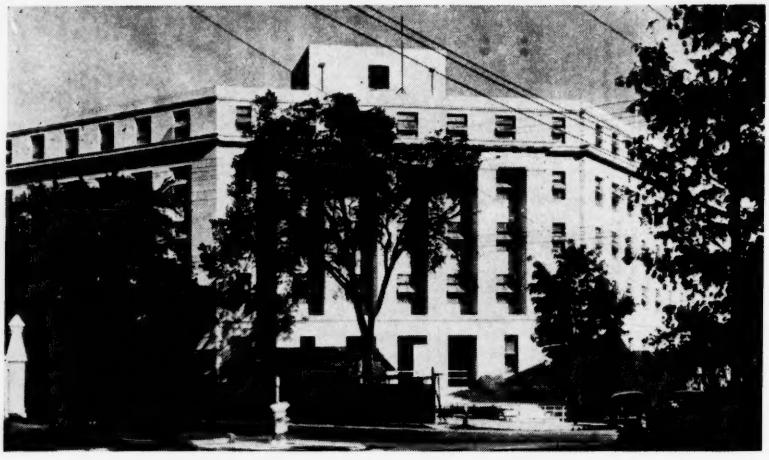
Wages paid out by the railroads in Louisiana last year totaled more than $19,000,000, or an average of one million dollars every twenty days.

The importance of railway payrolls in the economic life of Louisiana is strikingly shown by a comparison with payrolls of other industries. The payroll of the average manufacturing establishment in Louisiana, based on the 1935 census of manufactures, is around $28,000 a year, excluding railway repair shops. Therefore, the wages paid last year to railway employes in Louisiana were equal to the combined payrolls of 680 of the state's 1600-odd manufacturing plants.

Taxes which railroads pay for the support of schools and other public institutions, the maintenance and improvement of highways, local and state police protection, fire protection and other government activities, represent still another railway contribution to Louisiana's prosperity. Railroads are taxpayers in nearly every parish in the state. In many parishes, tax payments by individual railroads exceed those of any other property owners. In 1937, state, parish and local taxes paid by the Class I railroads in Louisiana totaled $4,122,000. This averaged $967.00 for every mile of railroad in the state. A detailed analysis of railway taxes and government costs in Louisiana in 1931 (the latest year for which such figures are available) showed that 38.5 per cent of all railway taxes in the state was used for public school purposes; 17.8 per cent was spent on highways, and 43.7 per cent was applied to other public expenses. The social security laws which have since been enacted have

(*Continued on page 56*)

Left—Carloads of wood en route to the pulp mill, and right, Louisiana & Arkansas Railroad's Shreveport timber yard



North Carolina's Office Building of Native Granite

North Carolina's newest State office building, a modern fireproof structure located at the northwest corner of the Capitol building, is due to be finished and ready for occupancy about the middle of December. Erected at a total cost of about $535,000, the new building will house under one roof a half dozen state agencies and departments which at present are scattered all over Raleigh in cramped and crowded quarters. This will bring the total up to six state buildings grouped around the Capitol, and will center practically all state activities on Capitol Square.

The new office building will be constructed of native Mount Airy granite, known as one of the most beautiful as well as enduring of materials. The design is in harmony with the Capitol building across the square.

The building, six stories high, is L-shaped with two wings, each approximately 134 feet long and 46 feet wide and a center section approximately 76 feet wide and 65 feet deep. Structural steel was used in the superstructure, granite in the street elevations and ends of each wing, brick in the rear wall, and the insulated roof is composed of slag material laid on insulating board. The walls will be of granite backed with brick, furring tile, and plaster, while the floors will be of the metal pan and concrete joist type with terrazzo in the offices and tile in the wash rooms. Passage doors will be wood with metal frame, doors to the stair towers will be of hollow metal, and windows will be the metal sash projecting type. The lobby and elevator lobby behind it will have marble walls and ornamental plaster ceilings.

The permanent partitions between the offices are of hollow tile, but other partitions will be of gypsum block laid on top of the finished floor, permitting future changes and alterations as needed.

Architects for the new structure were Northup and O'Brien, and general contractor was J. J. McDevitt Co. of Charlotte.

New Streamlined Diesel Locomotives

The Seaboard Air Line Railway, which has been operating train service since 1832 when the parent company, the Portsmouth & Roanoke Railroad was organized and placed in operation between Portsmouth and Weldon, N. C., will have Diesel-electric locomotives in operation this winter, according to C. E. Bell, Passenger Traffic Manager. Nine streamlined Diesels will be placed in service.

Mr. Bell claims for the Seaboard the first air conditioned trains and calls attention to improvements in the service, such as streamlined motor coaches and reclining-seat coaches. He states that "now for the first time electric service between New York and Florida is provided. The Diesels will be operated into Washington, D. C., this winter. These engines are not only the most powerful and longest type in the world, but are unique in the fact that they have control cabs at both ends. Each group of three locounits are tight-coupled and each unit is in reality a separate 1800 horsepower locomotive. Both ends of these locomotives can be fitted closely against other locomotive units or against passenger cars. They can be broken into six by using three of the "A" units alone as 1800 horsepower locomotives and making three 5600 horsepower locomotives by coupling the three "B" units to the three remaining "A" units. Each locomotive unit carries two 900 horsepower twelve cylinder, V-type, two cycle General Motors Diesel engines and each engine is equipped with a 600 volt direct current generator.

"While these locomotives are intended for the greatest possible speed, there has been no compromise with safety. A maximum of clear view of the track is given the operator from the control cab placed at a high vantage point in the front of the locomotive. Controls are simpler than those of an ordinary automobile. It requires less effort to start and stop the train than it does in the operation of an automobile, despite the enormous power and weight of these giants of the rails."

Large Cigarette Paper Factory Under Construction

Of the 160,000,000,000 cigarettes manufactured in the U. S. over 90 per cent are made in the South and nearly 60 per cent come from North Carolina

BY

Bill Sharpe

N. C. Department of Conservation and Development

FOR years the world's leading producer of cigarettes, North Carolina, with the completion of the $2,000,000 Ecusta Paper Corporation plant at Brevard in 1939, will furnish more of the "makings" for the industry when production of cigarette paper commences.

Situated on a 200-acre tract of land in the Toxaway mountains of Transylvania County and traversed by the river Davidson, an army of workers with giant pile drivers are engaged in construction of the new plant. Already the course of the river has been diverted, pilings have been sunk to a depth of eighteen feet, and steel and concrete are converging into the semblance of a structure from which soon will come the bobbins of cigarette paper for the 160 billion cigarettes manufactured annually in this country.

Locating engineers and cigarette paper manufacturers agree that the broad plain of the Davidson River in the Appalachian Mountains of North Carolina is one of the finest sites to be found in America. An abundance of pure water is given as one of the prime requisites of cigarette paper making. Here, where the Davidson rushes down from the Pisgah National Forest, state water resources engineers of the Department of Conservation and Development found virgin water of the purest quality.

The plant now under construction will, in many respects, mark the beginning of a new industry in the United States. Almost all of the high type cigarette paper used by the leading cigarette manufacturing companies in their national brands is at present imported from France.

It has been stated that the purpose of the new American plant in North Carolina will be to produce paper of this same high standard, with the added factor that it is expected to use American produced raw materials, so that the finished product will be an American product from beginning to end.

Experiments have been carried on for a number of years in employing such American raw material, flax produced in many localities in this country, in the manufacture of this high type of cigarette paper. The success of these experiments in producing pulp and paper from fibrous flax grown in this country, prompted the establishment of the Ecusta plant in North Carolina.

The United States is ranked as the world's fourth largest producer of flax, and provides large stores of raw materials for processing. Flax growing experiments by agricultural specialists in the mountain region of North Carolina have proved this area capable of producing fibrous flax of an excellent quality.

Associated in the Ecusta Paper Corporation are interests connected with Papeteries Rene Bollore of Odet and Cascadec, France, and Papeteries de Champagne of Troyes, France. Both of these companies are leaders in their field, and their products are used largely in this country.

Through this combination, the North Carolina plant has at its disposal not only all production knowledge gained

(*Continued on page* 61)

Driving piles into the ground at Brevard, N. C., where the first large American cigarette paper factory will be built

Left—The river Davidson from which will be drawn the supply of water to make the cigarette paper. Right—Laying the foundations for the new plant at Brevard, N. C.

Chemical Industries Based on Petroleum

BY

Dr. Gustav Egloff

Universal Oil Products Company
Research Laboratories
Chicago, Illinois

PETROLEUM and natural gas are available in enormous quantities in the United States. During 1937 the world production of crude oil was over 2,000,000,000 barrels yielding about 775,000,000 barrels of motor fuel. The major use of crude oil has been in the manufacture of motor fuel, lubricants, fuel oil, and asphalts. However, the production of synthetic compounds from petroleum due to definite research is founding new chemical industries.

The modern cracking process converted 900,000,000 barrels of heavy oil into 360,000,000 barrels of high octane motor fuels, 450,000,000,000 cubic feet of gas, with fuel oil and coke as other products. The cracking process, although primarily used for the production of gasoline, also yields olefinic hydrocarbons in vast quantities from which synthetic products such as alcohols, glycols, ethers, ketones, acids, chlorinated products, resins, insecticides, plant growth inducers, solvents, rubber substitutes, and plastics are being produced.

The commercial value of hydrocarbon gases from the cracking process has been greatly enhanced by the growing demand for high octane motor fuels and synthetic products made available through catalytic processes. During the past fifteen years or so the possibility of using petroleum hydrocarbons for synthesizing chemical products has been shown to be not only possible, but also an economic method for utilizing the unsaturated hydrocarbons produced during cracking reactions. Not only by-product manufacturers have shared in this development, but the oil industry itself has developed along the lines of synthesis.

In the past the hydrocarbons derived from coal carbonization have been the source material for many chemical derivatives. However, since the advent of the modern cracking process this supremacy has been challenged due to the fact that all hydrocarbons derivable from coal can be produced from crude oil. In addition, compounds are commercially available from crude oil, natural gasoline, and natural gas which are not readily produced from coal. Paraffins, olefins, acetylenes, aromatics, cycloolefins, cycloparaffins, and terpenes are derivable from petroleum which are starting hydrocarbons for many synthetic compounds.

For many years sulfuric acid has been the agent used to refine motor fuel and lubricants. This type of refining involves a heavy loss due to polymerization, oxidation, and solubility of certain hydrocarbons in the acid. These effects are eliminated when using solvents to separate the high viscosity index hydrocarbons from those of low quality, due to the employment of physical separation rather than chemical refining. Such solvents as phenols with and without propane, dichlorethylether (chlorex), furfural, acetone, nitrobenzene, aniline, chloraniline, and benzol-sulfur dioxide are used for improving lubricating oils.

Lubricants have been manufactured by polymerizing butenes, pentenes, and light fractions of gasoline from the cracking of paraffin wax or waxy oils by means of aluminum chloride. When manufacturing lubricating oils from ethylene, it was found that the viscosity-temperature coefficient was inferior, but by thermal polymerization followed by aluminum chloride treatment an improved lubricant resulted. Since the viscosity of the lubricant is a function of the length of the straight chain in the molecule, the polymerization treatment most advisable in lubricating oil production is that which increases the lengthening rather than the branching of the chain. A further observation has also been made, that the more straight chain the molecule, the less readily it will polymerize.

It is estimated that the lubricant and repair bills of gasoline and Diesel motors used throughout the world can be reduced over $150,000,000 a year by use of the new lubricating oils available.

Many alcohols, glycols, and ketones are commercially produced from petroleum, some of which were chemical curiosities a few years ago. Ethyl alcohol which has been produced for many years by fermentation is finding the sharpest competition with that produced from ethylene from cracked gases. Over 10,000,000 gallons of ethyl alcohol are produced in the U. S. yearly at a price competitive with that of other methods of production. All of the 110,000,000 gallons of ethyl alcohol required yearly in the U. S. could readily be produced from cracked gas at a price level lower than that of the fermentation process. Alcohols such as isopropyl, butyl, pentyl, hexyl up to cetyl are commercially derived from cracked gases or gasoline by means of sulfuric acid or hydrolysis of chlor derivatives.

It is important to point out that methanol is being produced commercially in the U. S. by the controlled oxidation of natural gas, which is highly competitive with methanol from wood distillation and catalytic treatment of carbon monoxide and hydrogen.

The gallonage of alcohols potentially available from the olefins present in the gases produced yearly throughout the world from the cracking process shows that on the basis of ethylene 6 per cent, propene 13.3 per cent, and butene 6 per cent, the ethyl, isopropyl, and isobutyl alcohols producible from these olefins in 440,000,000,000 cubic feet of cracked gas produced was:

Ethyl alcohol	468,000,000 Gals.
Isopropyl alcohol	1,358,000,000 Gals.
Isobutyl alcohol	902,000,000 Gals.
Total alcohol	2,729,000,000 Gals.

A number of commercial alcohols are produced from petroleum in addition to ethyl, isopropyl, isobutyl, such as pentyl, isopentyl to octyl with some tertiary alcohols also.

Glycols such as ethylene, propene, diethylene, and triethylene are being produced synthetically from the corresponding olefins. Ethylene glycol is used in greatest quantities and its primary use is for radiator antifreeze liquid or cooling fluid for motors. Other uses are as solvent for dyes in the textile industry. Diethylene glycol in the form of its nitrate is important in explosives due to the low freezing point and solvent power in blasting gelatines.

The total volume of the high antiknock ethers potentially available from the hydrocarbon gases derived from the cracking process when blended with motor fuel and leaded would be over 2,500,000,000 gallons a year.

Ketones produced from cracked products are widely used as solvents in the manufacture of rayon, smokeless powder, lacquers, bituminous paints, and in the dewaxing of lubricating oils; they are also used as high antiknock substances in motor fuel.

The halogenation of hydrocarbons derived from natural gas or petroleum has developed a number of useful products such as ethylene dichloride, ethylene trichloride, propylene dichloride, amyl

chlorides, and chlorhydrins which are source materials for many other derivatives.

Chlorination of natural gas produces substitution products of methane, including methylene chloride, chloroform and carbon tetrachloride, which are used as solvents. Methyl chloride finds use as a methylating agent and refrigerant. The analogous methyl bromide has been proposed as a fire extinguisher.

Treatment of 1-pentene and 1-hexene with bromine and then with alkalies gives the corresponding acetylenes, useful as intermediates in the manufacture of aldehydes, ketones, acids, hydrocarbons and other derivatives.

Ethylene from cracked gases is one of the base materials used in the production of synthetic rubber called Thiokol. Ethylene is chlorinated to ethylene dichloride, and treated with a sodium-sulphide complex. These high-polymer condensation products are competitive with natural rubber and synthetic rubbers for use as hose, ceiling or floating roofs, moulded articles, cable insulations, etc.

"The esters of a large number of acids can be made from Pentasol, a mixture of the synthetic amyl alcohols. By far the most important of these is Pent-acetate, the acetic acid ester of Pentasol which is used in large quantities in the lacquer industry.

"Tartaric acid with amyl alcohol forms diamyl tartrate which along with amyl stearate and diamylphthalate is of commercial interest as a plasticizer.

"Numerous other amyl derivatives are made from mixed amyl chlorides. One of these is amyl mercaptan. Its use as an odorant in natural gas is increasing rapidly. Seven-tenths of a pound of amyl mercaptan added to 1,000,000 cubic feet of gas will impart a sufficient odor to warn that unburned gas is escaping somewhere in the house. Breaks in pipe-lines as much as 7 feet underground have been located by its use.

"Amines enter into all the typical reactions of amines. They can be condensed with aldehydes, ketones, and oxides. The hydrogen of monoamylamine with metallic sodium reacts forming sodium amylamide. The amines also react with phosgene, urea, cyanic acid, thiocyanic acid and isocyanates to give ureas and thioureas. Being strong organic bases, the amylamines react readily with fatty acids forming organic soaps. These soaps have excellent emulsifying properties.

"Other derivatives of the amyl chlorides are those formed by their reaction with benzene, naphthalene, aniline, phenylenediamines, diphenylamine, benzylamines, phenol, cresols and other related compounds. It is thus possible to prepare a whole series of mixed aliphatic-aromatic derivatives which in turn can serve as raw materials for other syntheses.

"The dichloropentanes are solvents for rubber, grease, resins, and bituminous materials. Their comparatively high flash-point (110° F.) minimizes the fire hazard. Because of the relatively low evaporation rate, they are useful in paint and varnish removers, and for the final cleaning of metal surfaces to be electroplated. They are also useful for certain types of soil fumigation.

"Thus, from the two-pentanes a large variety of commercially important synthetic organic chemicals are being produced. Numerous other derivatives can be made from the available amyl chlorides, alcohols and amylenes. The same chlorination principles are applicable also to other hydrocarbons, and accordingly the number of similar products containing other than five carbon atoms which could be made in a similar manner is almost unlimited."

Plant Growth Increasers

The use of olefin gases from the cracking process has been developed to accelerate the ripening of fruit and to increase the rate of plant growth such as potatoes and fruit trees.

Ethylene and propene have been used in the stimulation of potato growth and transformation of starch into sugar. The effect upon growth has been to bring tomatoes, grapefruit, oranges, etc. to full maturity in a shorter growth season.

Recently, it has been shown that butenes have a similar effect in shortening the production season of such trees as the walnut, peach, apple, pear, apricot, plum, prune, and cherry. In periods when the season is too short to allow the full maturing, due to winter weather being so prolonged that flower formation and fruit setting are delayed, butene may be used to hasten the growth period. The procedure which has been adapted to plant treatment consists of enclosing the trees in tents or gas-tight covers about two weeks before the normal or desired leafing, i. e. start of the growth cycle. Butene is passed into the tent in about one part per 100,000 parts of air, at temperatures between 60° and 100° F. for a period of one to two hours.

Another method for ripening fruits is to use pentenes, hexenes, and heptenes from cracked gasoline. Addition products of the unsaturated hydrocarbons derived from cracking such as ethylene diodide, ethylene butyrohydrin, ethylene acetohydrin and ethylene formohydrin are also used as agents for furthering the ripening of fruit.

The skin of the green fruit absorbs the olefin or olefin derivative, destroying the chlorophyll. The advantage in using liquids as ripening agents is that they are absorbed and continue their ripening action after removing the fruit from the liquid; after storage under normal conditions the ripening is complete.

The germination of dormant potatoes has been brought about by both dipping and soaking the tubers in ethylene chlorhydrin solution. The procedure necessary has depended on the variety of tuber and on the stage of dormancy.

Ethylene oxide has been used to fumigate tobacco, cereals and other food products. Insects and insect larvae are readily killed by this gas, and there is no harmful effect when breathed by human beings.

The resin and plastic industries are growing at an amazing rate and petroleum may well become the primary source of many types. A number are already in commercial use as reported by Dr. Per K. Frolich of the Standard Oil Development Company.

1. Cracking Coal Tar Resins—by condensation of highly condensed petroleum hydrocarbons, such as those which are present in the tar bottoms from the cracking operation, with formaldehyde or sulfuric acid.

2. "Santo" Resin—by reaction of olefins and diolefins in the presence of aluminum chloride.

3. "Vistanex"—by polymerization of unsaturated gaseous hydrocarbons with metallic halides to give substantially linear polymers ranging in consistency from that of a viscous oil to rubbery materials having molecular weights as high as 300,000.

4. Cellulose Acetate—by reaction of cellulose with acetic anhydride, which may be derived from ketene obtained by thermal decomposition of acetone produced by dehydrogenation of isopropyl alcohol.

5. Ethyl Cellulose—by reaction of cellulose with ethyl chloride or diethyl sulfate produced from ethylene.

6. Vinyl Resins—by polymerization of vinyl chloride and vinyl acetate derived from acetylene or ethylene.

7. Phenol-Formaldehyde Resins — by condensation of formaldehyde with phenols.

8. Alkyl Resins—by reaction of dibasic acids with polyhydric alcohols.

9. Polysulfones—by reaction of unsaturates with sulfur dioxide under conditions favoring the formation of high molecular weight products.

10. "Thiokol"—by condensation of sodium poly-sulfide with ethylene dichloride or other chlorine containing derivatives.

11. "Neoprene" Rubber—by polymerization of chloroprene derived from acetylene.

12. "Buna" Rubber—by polymerization of butadiene.

Sulfuric Acid from Hydrogen Sulfide

The oil industry is the second largest user of sulfuric acid in the U. S. During 1937, 1,210,000 short tons were used. The oil industry can now produce its own acid. The sulfuric acid industry based

(*Continued on page* 58)

South's Contract Drop Slight

TOTAL contracts for September in the South, prepared from daily *Construction* reports were $71,996,000. This was slightly below August awards, which surpassed by more than 20 per cent contracts placed in September, 1937.

Private and public building contracts declined, but new highway and bridge and engineering construction increased.

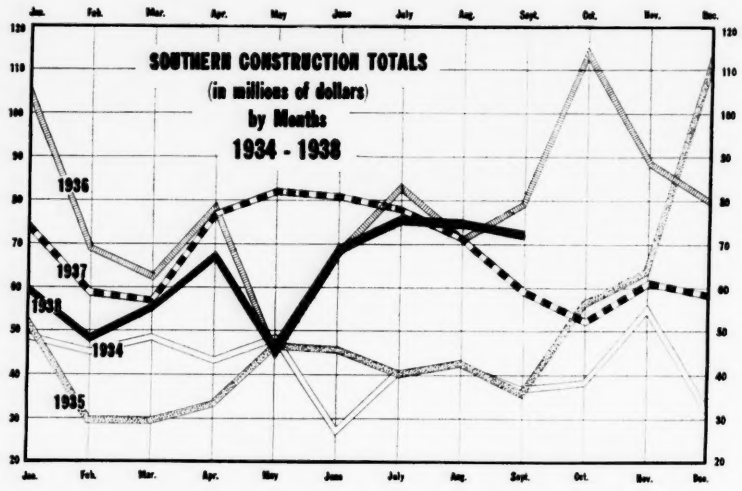
The total for all types of work as classified in the columns of the daily *Construction* reports is $566,698,000 for the nine months of this year. This is 11 per cent lower than at the end of a similar period of 1937.

Highway and bridge work to be started, shown by bids opened and contracts awarded during September in the Southern states, is higher by almost 30 per cent compared with the preceding month, and by more than 63 per cent compared with September a year ago.

New road work is valued at $24,317,000, a figure above any for the months of this year except July. All of the Southern states are represented in the list of work to be started.

Projects of an engineering character, other than plant construction, in September went well ahead of both the preceeding month and September of last year. Dredging, levees and other measures for flood control, drainage and harbor and river improvement, jumped precipitately to $8,960,000, as compared with August's $1,436,000 and the $2,846,000 of September of 1937. Sewer and water works contracts are higher than they have been since January. Compared with September of 1937, they have increased more than twofold. Industrial awards of $7,095,000 are low, although in February the total fell to the lower level of $4,783,000.

Private building in September totaled $10,292,000, showing a nine per cent drop from that of the previous month. The



$5,584,000 for apartment and hotel work, however, betters not only all monthly totals for this type of work during 1938, but for those of previous years as well. Dwelling awards are down. At no time since March of 1936 have they been lower. All other types of private building are behind the value of contracts placed during August, 1938, and, with exception of association and fraternal building, during September of last year.

Public building did not take the upward trend expected at the beginning of September. The total of $18,704,000 is almost fourteen per cent under the August figure. The huge amount of Public Works funds recently made available for governmental and school construction, especially for the latter, is anticipated to swell the totals of future months, just as the awards for highway and other engineering construction have bolstered the total for September.

The total valuation of contracts let for industrial construction is made up principally of smaller enterprises. A $1,000,000 award, however, was reported for the building materials plant proposed at Jacksonville, Fla., by the United States Gypsum Co. George A. Fuller Co., New York construction firm, is reported to have received this contract. Hudson Silk Knitting Mills' plan for making a $1,000,000 investment for plant and equipment at Charlotte, N. C., is an important proposed project.

Virginia Electric and Power Co., Richmond, announced award of the contract for a $3,000,000 addition to its local Twelfth Street power station. Stone & Webster Engineering Corp., of Boston, Mass., will do the engineering and construction work, which is to include in-

(Continued on page 38)

Statistics of the South's Construction

	Contracts Awarded September 1938	Contracts Awarded September 1937	Contracts to be Awarded September 1938	Contracts to be Awarded September 1938	Contracts Awarded First Nine Months 1938
GENERAL BUILDING					
Apartments and Hotels	$5,584,000	$4,221,000	$2,806,000	$1,901,000	$35,412,000
Association and Fraternal	101,000	95,000	395,000	75,000	1,770,000
Bank and Office	364,000	520,000	570,000	438,000	8,265,000
Churches	514,000	761,000	922,000	973,000	6,821,000
Dwellings	2,310,000	10,285,000	10,756,000	3,105,000	51,380,000
Stores	1,419,000	1,879,000	3,166,000	4,201,000	25,771,000
	$10,292,000	$17,761,000	$18,615,000	$10,693,000	$129,419,000
PUBLIC BUILDINGS					
City, County, Government and State	$9,923,000	$7,944,000	$46,584,000	$40,358,000	$74,145,000
Schools	8,781,000	1,921,000	48,195,000	20,529,000	46,802,000
	$18,704,000	$9,865,000	$94,779,000	$60,887,000	$120,947,000
ROADS, STREETS AND BRIDGES	$24,317,000	$14,899,000	$28,146,000	$28,360,000	$159,973,000
INDUSTRIAL AND ENGINEERING					
Drainage	$8,960,000	$2,846,000	$9,681,000	$12,013,000	$24,107,000
Filling Stations and Garages	261,000	625,000	111,000	444,000	4,264,000
Industrial Plants	7,095,000	12,501,000	33,195,000	46,746,000	110,613,000
Sewers and Waterworks	2,367,000	1,035,000	22,413,000	8,312,000	17,375,000
	$18,683,000	$17,007,000	$65,400,000	$67,515,000	$156,359,000
Total	$71,996,000	$59,532,000	$206,940,000	$167,455,000	$566,698,000

"EXACTING ENGINEERS PREFER POWELL STEEL VALVES"

1500 POUND
WELDING END
GLOBE VALVE
SPUR GEAR OPERATED

1500 POUND
WELDING END
GATE VALVE
WITH BY-PASS
AND MOTOR OPERATED

Powell steel valves have made a definite mark in the engineering world for greater efficiency in low and high pressure control equipment. Write for detailed information regarding your particular problem!

POWELL VALVES

THE WM. POWELL CO. CINCINNATI, OHIO

South's Contract Drop Slight

(*Continued from page* 36)

stallation of a 40,000-kilowatt turbo-generator and a new steam boiler. Rural electrification work and local power projects continue to figure prominently in power facility construction, many such undertakings being in prospect as the allotments of Federal funds are made or being applied for.

Work is understood to be scheduled to start soon on a $1,000,000 refinery improvement program for the Mid-Continent Petroleum Corp., at Tulsa, Okla. Initial construction is to begin in the lubrication department. Cole Chemical Company's $75,000 chemical laboratory at St. Louis, Mo., Anheuser-Busch's $50,000 grain storage plant in the same city, and the Nebel Knitting Company's $100,000 expansion program at Charlotte, N. C., are among the more moderately-sized industrial projects.

Typical Southern Projects Last Month

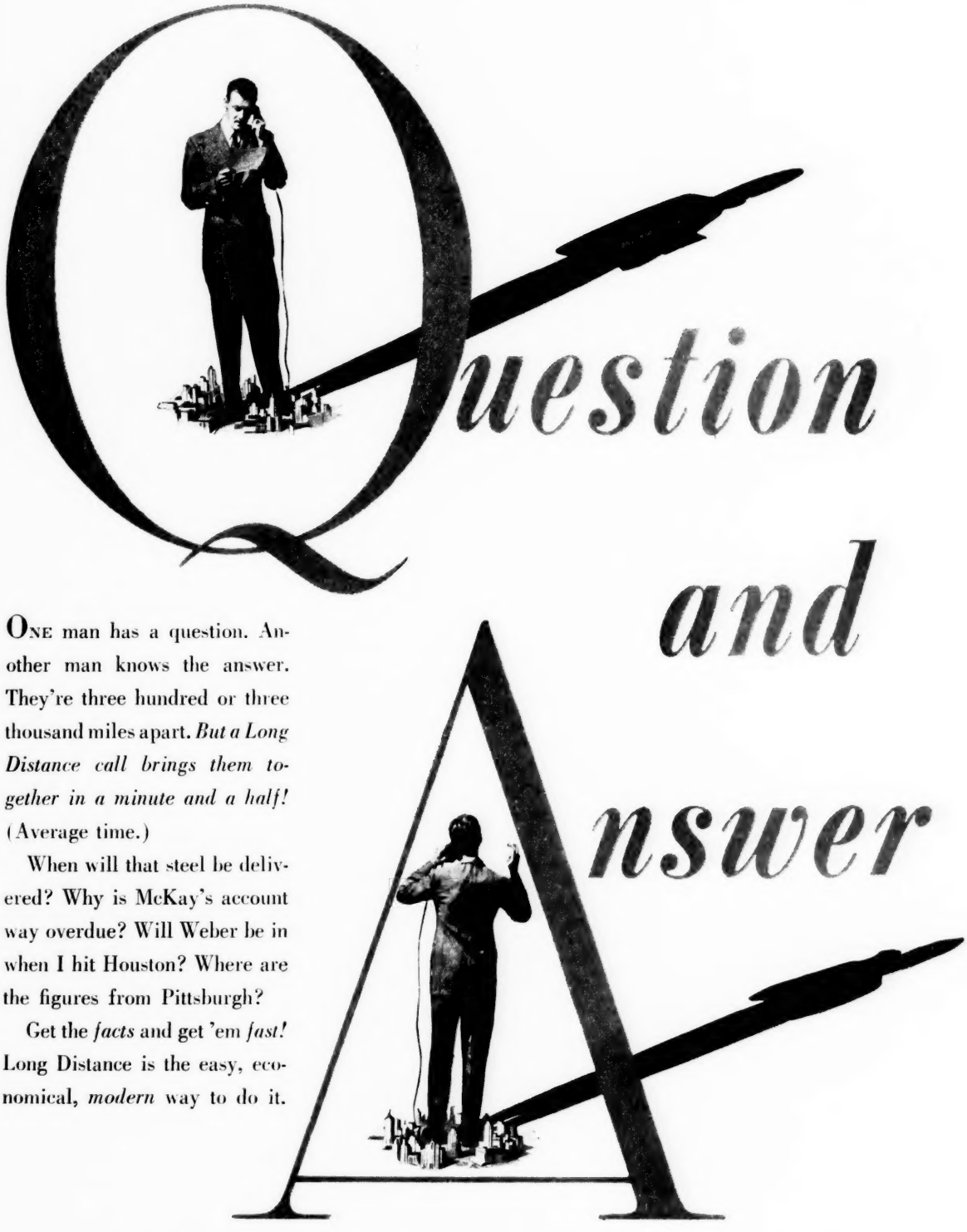
Proposed Construction

Ala., Birmingham—City
City hall; George P. Turner, Archt. $2,582,000
Ala., Enterprise—Coffee County Board of Education
Building additions and alterations 236,000
Ala., Tuscaloosa—University of Alabama
Medical center 2,500,000
Ark., Booneville—State Tuberculosis Sanatorium
Construction program; Haralson & Mott and Erhart & Eichenbaum, Fort Smith, Archts. 2,108,826
Ark., Fayetteville—University of Arkansas
Buildings 750,000
D. C., Washington—Freedmen's Hospital
Tuberculosis unit 600,000
D. C., Washington—District Commissioners
Municipal courts building 1,300,000
D. C., Washington—Jerry Maiatico
Office Building; M. G. Lepley, Archt. 180,000
Ga., Atlanta—Massell Realty Co.
Store units; E. C. Seiz, Archt. 150,000
Ky., Covington—Board of Education
Auditorium additions 975,000
Ky., Pikesville—Pike County Board of Education
Buildings; Hugh Meriwether, Archt. 303,000
Ky., Richmond—Eastern Kentucky State Teachers' College
Student Union Building 389,000
La., Alexandria—Rapides Parish School Board
Building; Charles T. Roberts and C. Errol Barrons, Alexandria, Archts. 200,000
La., Baton Rouge—Southern Bell Telephone and Telegraph Co.
Exchange building 1,000,000
La., Hammond—Southeastern Louisiana College
Buildings; Weiss, Dreyfous & Seiferth, New Orleans, Archt. 1,299,000
La., Hodge—Advance Bag & Paper Co.
Plant addition 300,000
La., Lafayette—Southwestern Louisiana Institute
Building program; Weiss, Dreyfous & Seiferth, New Orleans, Archt. 2,357,000
La., Lake Charles—U. S. Engineers
Ship Channel 9,600,000
La., New Orleans—State School for Deaf
Construction program; Favrot & Reed, Archts. 465,000
La., Shreveport—Arkansas Fuel Oil Co.
Refinery addition 975,000
Md., Baltimore—Frank Novak Realty Co.
Dwellings; G. F. Smithson, Archt. 150,000
Miss., Vicksburg—Board of Education
Buildings 318,000
Mo., Clayton—Clayton and Hanley Apartments
Building; Cay Weinel, St. Louis, Archt. 135,000
Mo., St. Louis—Board of Education
School building; (Mallinckrodt) 225,000
Building (Stowe Teachers' College) 420,000
N. C., Charlotte—City
Hospital (Charlotte Memorial); W. W. Hook, Archt. 1,030,000
N. C., Charlotte—Hudson Silk Knitting Mills, Inc.
New buildings, equipment 1,000,000
N. C., Charlotte—Nebel Knitting Co.
New equipment, building addition 100,000
N. C., Durham—American Tobacco Co.
Plant addition 500,000
N. C., Fayetteville—Board of Education
School buildings 303,000
N. C., Greensboro—University of North Carolina
Dormitories, dining hall and building additions 182,000
N. C., Greensboro—Women's College of University of North Carolina
Science building, additions 324,000
N. C., Greenville—City
Water and light system extension 374,000
N. C., Statesville—City
Sewerage works improvements 355,000
N. C., Wilmington—Southern Bell Telephone & Telegraph Co.
Dial system 685,000
Okla., Tulsa—Mid-Continent Petroleum Corporation
Refinery improvements 1,000,000
S. C., Charleston—The Citadel
Armory unit 610,000
Tenn., Chattanooga—City
Library Building; Crutchfield and Law, Archts. 298,000
Tex., Dallas—Highland Park Presbyterian Church
Church and Sunday School building; Mark Lemmon, Archt. 303,000
Tex., Dallas—Hilton Hotel
Remodeling 150,000
Tex., Houston—White House Dry Goods Co.
Department store; Stone and Pitts, Beaumont, Archts. .. 500,000
Tex., Victoria—Victoria Bank & Trust Co.
Building; C. H. Page, Austin, Archt., W. E. Simpson Co., San Antonio, Struc. Engr., L. D. Royer, San Antonio, Mech. Engr. 150,000
Va., Ocean View—Chesapeake & Potomac Telephone Co. of Virginia
Central office building, dial installation 215,000
W. Va., Webster Springs—Webster County Board of Education
School additions 325,000
W. Va., Wheeling—City and Ohio County
City-County building; E. Bates Franzheim, Archt. 800,000

Contracts Awarded

Ala., Birmingham—Redmont Village, Inc.
Apartment building; B. L. Jackson, Jr., Inc., Silver Spring, Md., Contr. $1,250,000
Ala., Mobile—City Commission
Wharf; Raymond Concrete Pile Co., New York, Contr. .. 346,000
Ala., Tuscaloosa—State Hospital Board
Women's Building (Bryce Hospital); Skinner-Biederman Construction Co., (low bidder) 300,000
Ala., Tuscaloosa—University of Alabama
Auditorium; Skinner-Biederman Co. 256,000
Ark., Little Rock—City
Sewer reconstruction; S. E. Evans Construction Co., Fort Smith (low bidder) 259,000
D. C., Washington—District Commissioners
Calvin Coolidge High School; Jeffress-Dyer, Inc., Washington (low bidder) 1,326,000
Fla., Jacksonville—U. S. Gypsum Co.,
Building; George A. Fuller Co., New York, Contr. 1,000,000
Fla., Miami Beach—Artlin, Inc.
Hotel, Fred Howland, Inc., Miami, Contr. 130,000
Fla., Miami Beach—Lakeside Improvement Co.
Hotel-apartment; L. H. Miller Co., Contr. 500,000
Ga., Fort Benning—Constructing Quartermaster
Barracks; Beers Construction Co., Atlanta, Ga., Contr. .. 644,000
Bakers' and Cooks' School and barracks; Murphey Pound, Columbus, Contr. 108,030
Ga., LaGrange—Troup County Commissioners
County courthouse and jail; A. J. Honeycutt, Inc., Birmingham, Ala., Contr. 700,000
Ky., Fort Knox—Constructing Quartermaster
Barracks; Struck Construction Co., Louisville, Contr. ... 125,000
Barracks; Great Lakes Construction Co., Chicago, Ill., Contr. 338,000
La., New Orleans—U. S. Engineers
Earthwork (Second New Orleans District); Mark C. Walker & Son Co., Memphis, Tenn. (low bidder) 252,000
Md., Baltimore—Hilton Village, Inc.
Apartment center; Consolidated Engineering Co., Contr. 700,000
Md., Baltimore—University of Maryland
Hospital additions; John McShain, Contr. 201,000
Md., Fort George G. Meade—Constructing Quartermaster
Bakers' and Cooks' school and barracks; C. W. Schmidt, Baltimore, Contr. 123,000
Miss., Sardis—U. S. Engineer Office
Spillway (Sardis Dam); Hooper Construction Co., Jacksonville, Fla. (low bidder) 1,654,000
Mo., Columbia—State Cancer Commission
Hospital; Dickie Construction Co., St. Louis, Contr. ... 454,000
Mo., Kansas City—U. S. Engineer Office
Dikes and revetment; Bilhorn, Bower & Peters, Inc., Clayton (low bidder) 169,000
N. C., Fort Bragg—Constructing Quartermaster
Barracks; Dixon Construction Co., Fayetteville, Contr... 173,000
N. C., Greensboro—City
Steel pipe line; A. H. Guion & Co., Charlotte, Contr. 137,000
N. C., Raleigh—North Carolina State College
Chemistry building; Jones Construction Co., Charlotte, Contr. 244,000
Oklahoma—U. S. Engineers
Embankment, excavation for spillway; (Fort Supply dam); Morrison-Knutson Co., Boise, Idaho, W. C. Cole, Los Angeles, Calif. (low bidders) 1,511,000
Okla., Fort Sill—Constructing Quartermaster
Barracks; A. J. Rife Construction Co., Dallas, Tex., Contr. 348,000
Okla., Vinita—State Board of Public Affairs
Ward Building (Eastern Okla. Hospital for Insane); Daugherty-Vinson Construction Co., Tulsa, Contr. 255,000
S. C., Charleston—College of Charleston
Student activities building; Guion Co., Charlotte, N. C... 218,060
Tenn., Chattanooga—Electric Power Board
Underground network; Wright & Lopez, Cedartown, Ga., Contr. 299,000
Tenn., Columbia—City
Distribution system; Fritz Zeibarth, Omaha, Neb., Contr. 221,000
Tenn., Memphis—Kimbrough Corporation
Apartment building; S. & W. Construction Co., Contr. ... 500,000
Texas—U. S. Engineers
Dredging (Sabine-Neches Waterway); Atlantic, Gulf & Pacific Co., New York, Contr. 496,000
Tex., Dallas—Stevens Park Apartments, Inc.
Apartment project; Owner builds 750,000
Tex., Houston—E. H. Borden
Apartment buildings; Borden Construction Co., Contr. ... 709,000
Tex., Raymondville—Willacy County Water Control and Improvement District No. 1
Irrigation pipe; Dodds & Wedegartner, San Benito; F. M. Reising Construction Co., Edinburg, Contr. 646,000
Tex., Texas City—Board of Education
School building program; Gilbert Falbo Co., San Antonio, Contr. 220,000
Va., Grundy—Board of Education
School building; J. F. Barbour & Son, Roanoke, Contr. .. 206,000
Va., Petersburg—State Hospital Board
Ward building (Central State Hospital); John T. Wilson Co., Inc., Richmond, Contr. 186,070

LONG DISTANCE means



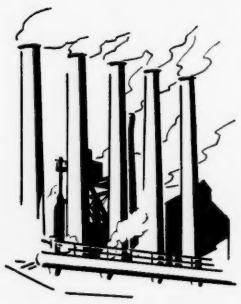
ONE man has a question. Another man knows the answer. They're three hundred or three thousand miles apart. *But a Long Distance call brings them together in a minute and a half!* (Average time.)

When will that steel be delivered? Why is McKay's account way overdue? Will Weber be in when I hit Houston? Where are the figures from Pittsburgh?

Get the *facts* and get 'em *fast!* Long Distance is the easy, economical, *modern* way to do it.

and QUICK ACTION too!

Iron, Steel and Metal Market



THE slight decline in steel production in the last week of September was not large enough to be of particular significance. When the anticipated automobile demand is in evidence it is believed it will bring a marked advance in production. Automobile manufacturers are optimistic about the outlook for next year's models which are now being shown by dealers.

Steel prices for the fourth quarter have been announced. They include reductions in steel rails and track accessories. Steel now being produced is going into consumption and buyers are not adding to inventories as prompt deliveries are being made and prices until the end of the year are known.

Scrap dealers feel that the future of their business offers good prospects, visualizing an increased demand as ingot production increases.

In ingot production, Pittsburgh was scheduled the last of the month to be at the highest rate in a year. Some of the large independent companies are operating at about 50 per cent of capacity. Chicago showed a slight drop, but still keeps ahead of the previous month.

Employment in the industry, according to the American Iron and Steel Institute, for the first half of this year was higher than similar periods in 1934 and 1935, although operations from January to June 30 this year were one-third below either of the two previous periods. A survey made by the Institute revealed a considerable reduction of output per man, with an increase in payroll costs per ton of steel produced.

Employment and Production

Since 1930, according to the same authority, the steel industry in the United States has paid out an average of $81,000,000 annually in cash dividends, or a return of 2.9 per cent on common and preferred stock, compared with 5.6 per cent in the ten years from 1920 to 1930. There has also been a progressive decline in earnings on invested capital. In 8½ years, ending June 30 last, this return was 1.5 per cent; in the ten-year period ending 1920, it was 5.5 per cent, and ten years before that 8 per cent. Total investment in the steel industry for the period given, ending June 30, was $4,737,000,000.

The production of steel ingots the first six months of this year was 34 per cent below the first six months of 1934, and 32 per cent below 1935.

Activity at Birmingham

In the Birmingham district orders are growing from month to month with 13 open hearth furnaces producing. The belief is held that progress will be constant, although gradual. Employment too will be increasing slightly. Similar views are expressed by pig iron manufacturers. There has been no recent decline in their production. Steel making in this district continues at 57 per cent of capacity, and with 14 blast furnaces in operation pig iron production is almost 80 per cent.

The Tennessee Coal, Iron and Railroad Co., has announced plans to resume shortly opertions at an ore mine, a coal mine and a blast furnace, which have been idle recently.

The Docena coal mine will resume production October 3, employing several hundred men. No. 11 ore mine at Ishkooda, idle since June 21, will start producing October 10, employing 200 men.

C. E. Abbott, vice-president in charge of raw materials, announced that these resumptions of operation are due to increased requirements for raw materials.

Blast furnace No. 5 at Ensley, down since June 9, has been re-lined and will begin operations October 5. This will make seven of eight blast furances in operation by T. C. I.

Railroad Buying

The railroads, which in normal times are always large purchasers of rails and other iron and steel products, have not been in position, financially, to purchase needed equipment. Due to the decrease in traffic and earnings equipment purchases in the first six months of this year were 80 per cent below those in the same period last year. When the solution of their problem is reached it will bring an improved outlook not only in steel and iron, but in many lines. Approximately two million gross tons of steel rail, sufficient to build a track ten thousand miles long, are normally purchased each year by the railroads of the United States.

The data the MANUFACTURERS RECORD has been printing in recent months which gives the extent and variety of purchases railroads make in various states of the South, even during depression times, shows very clearly their importance as buyers of all kinds of commodities. The list of articles is a long one, and they are bought even in remote sections of every state.

The Illinois Central System announced about the middle of September it had ordered 1,000 box cars from the American Car and Foundry Company at a cost of $2,700,000 for delivery early in 1939.

Exports of iron and steel products, according to the figures released by the Bureau of Foreign and Domestic Commerce, went above the 100,000-ton mark in August for the 23rd consecutive month. Foreign shipments amounted to 134,110 tons, with a valuation of $8,810,935.

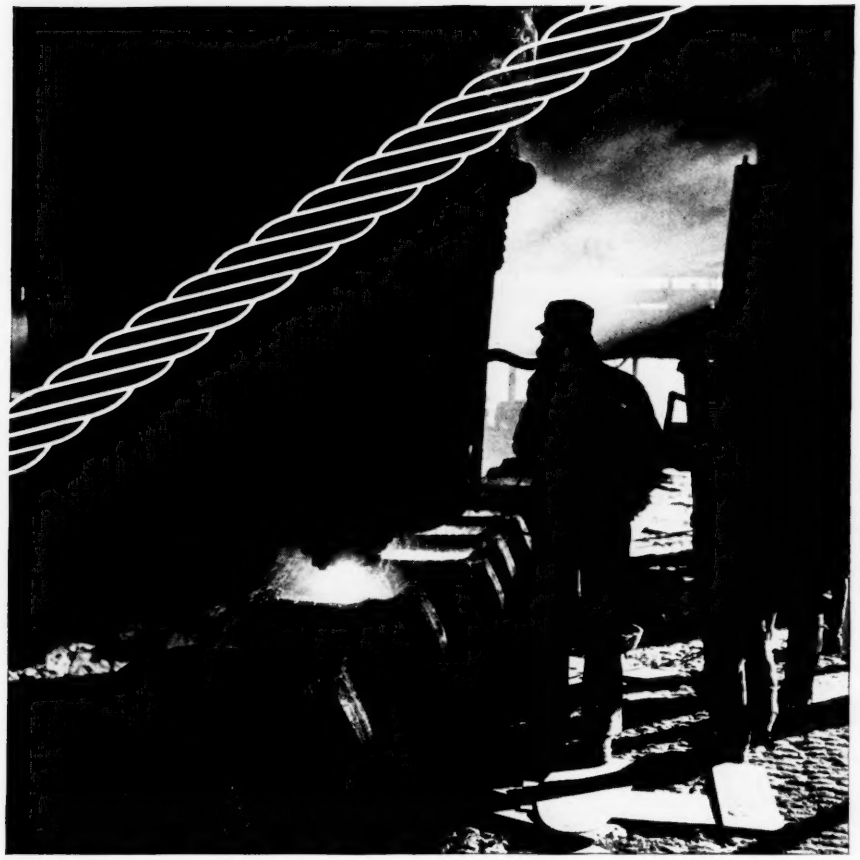
Exports of pig iron in August amounted to 19,756 tons in comparison with 10,371 tons in the preceding month. Both steel and iron exports were far below the figures of August 1937, in which month exports of these commodities were at an unusually high figure.

Rail exports, however, registered a sharp increase with 12,665 tons compared with 7,890 tons in August 1937.

Scrap iron exports also have declined markedly from those of a year ago. In August the dollar value of scrap export was $1,478,545, compared with $9,305,239 in August 1937.

Home Building and Steel

The fall and winter, it is expected, will witness a decided increase in home construction. Huge projects are already underway throughout the country and more are being planned. These include slum clearance in various cities both by private interests and Federal authorities. Building prices are probably at the lowest point they will be for some time unless signs fail. The effect will be pronounced in steel production. Not only is there more and more structural steel being used in private home building, but also in household esuipment, and as the demand for homes finds further expression ready-built steel houses, now produced by several manufacturers, will meet a wider market. It is doubtful if the extent of the development likely to be reached in such specialties can at present be visualized.



The *endurance* in Bethlehem Wire Rope starts with making the steel

For the rough-and-tumble tasks where the performance of wire rope depends largely on the endurance factor of the steel itself, there is a big advantage to you in specifying a Bethlehem Line. For at Bethlehem, the authority responsible for the performance of the finished rope has control over every step in the manufacturing—going back to the blast furnace or ore pile. With the accumulation of knowledge derived from three-quarters of a century of making fine steel and half a century of wire rope making, every phase of manufacture—refining the steel, rolling the billets, drawing the wire, making the rope—is carried out in the way to contribute the utmost in stamina.

Some other Bethlehem Products of particular interest to Southern Industry:

Steel Pipe—with many plus factors.

Steel Sheets—Black and galvanized, flat and formed.

Steel Plates and Flanged Products

Tool Steels—A complete range, covering every requirement.

Open-Web Steel Joists—for fire resistive, shrinkage-free floors.

Reinforcing Steel and Road Steel

Structural Shapes—Wide-Flanged Sections for heavy construction; Light Sections for economical use of steel where loads are light.

Fabricated Steel Structures of all types

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY

Lumber

News *of the Month*

Wood Floors for Dwelling Subject of Forest Service Circular

Wood is still the most popular of all flooring materials, especially for the home, according to the U. S. Forest Service.

While wood nearest at hand was no doubt employed for puncheon floors during pioneer days, the manufacture of flooring in this country is now confined to about a dozen native woods. The woods most commonly used include the four hardwoods, oak, maple, beech and birch and such softwoods as Southern pine, Douglas fir, western hemlock, western larch, redwood, western red cedar and Southern cypress. As redwood, red cedar and Southern cypress are very decay-resistant woods, flooring made from them is intended mainly for porches, summer-houses and similar locations where the floor is exposed to the weather and decay is a high hazard.

A wood floor laid over ordinary joist construction should be firm enough to bear the weight it receives without noticeable bending or deflection.

While house specifications prior to 1900 did not usually call for a subfloor, it is pointed out that the required high-type of floor can only be obtained by properly laying the finish over a suitable subfloor and correctly nailing both of the floors.

The new circular contains specific instructions and directions for selecting and identifying the flooring, laying the subfloor and the finish floor, nailing the shoe molding, and for finishing the floor with varnish, shellac, wax, or floor seals.

Standing Timber Prices More Stable Than Prices of Other Farm Products

Prices of both standing timber and sawlogs not only have been more stable than prices of other farm products since 1900, according to a report of the U. S. Forest Service, but have shown a distinct upward trend.

The report, by Henry B. Steer, senior forest economist, is published by the Department as Technical Bulletin 626, "Stumpage Prices of Privately Owned Timber in the United States."

Steer points out that many farmers can help stabilize their incomes by producing crops of forest products, particularly in the eastern United States, where neither stumpage nor log prices descended to the pre-War level in 1931-34, when the average price of all farm products was below the 1910-14 average.

Although the price records for different species vary somewhat, hardwood prices have generally increased to a greater extent than softwoods and remained at higher levels during the depression.

Softwoods are used principally in building and general construction work, the fields in which there is a keen rivalry of substitutes. The decline in softwood stumpage, log and lumber prices from the middle 1920's and 1932 resulted largely from inter-regional competition, reduction in building and construction, and the use of substitutes. Hardwoods, on the other hand are in much greater demand for furniture and interior finish and other specialty uses. Production has come largely from the comparatively limited stands in the eastern forests.

Poor selling methods and lack of knowledge of the markets are among the reasons given for lack of interest in timber sales by some owners.

Imports and Exports of Wood Pulp Increase

Exports of paper base stocks during July exceeded the June total by approximately 18 percent. The largest single gain in wood pulp exports was registered in "other wood pulp," with an increase of 287 percent. Unbleached sulphite, with a July total of 3,347 tons, increased 17 percent over the preceding month, but this figure was still about 64 percent below the same month in 1937. Exports of other paper stock decreased 7 percent during July with a total of 4,272,406 pounds.

Imports of paper base stocks including pulpwood increased approximately 5 percent during the month of July, showing a total of 88,087,026. This, however, was a loss of 32 percent as compared with the same month in 1937. Total imports of wood pulp decreased about 7 percent, with a total of 134,463 tons for July as compared with 144,558 tons in the month of June. This was also a loss of approximately 40 percent compared with the month of July 1937. Imports of unbleached sulphite pulp decreased 24 percent during July, with a total of 50,463 tons. On the other hand, imports of bleached sulphite increased 28 percent, the total tonnage being 27,029. However, this was a decrease of 49 percent as compared with the month of July of last year. Unbleached sulphate imports, with a total of 39,315 tons, marked an increase of 6 percent over the month of June of this year. Rags for paper stock decreased 10 percent, while imports of all other paper stock increased about 24 percent.

Slash Pine Forest and Farm Fair

Under the direction of the Herty Memorial Committee, six day Slash Pine Forest and Farm Fair will be held in Lake City, Florida, from November 14 through 19, 1938. The festival is sponsored by the Slash Pine Forestry Association and will be in the nature of a memorial and tribute to the late Dr. Charles H. Herty whose untiring efforts resulted in demonstrating the value of Southern slash pines. It is estimated that from 50,000 to 75,000 persons will attend the festival.

Southern Paper Festival

Definite plans are now under way for the first of the proposed Annual Southern Paper Festivals, to be held in Savannah, Georgia, from April 17 to 19, 1939.

Designed for educational purposes and to stimulate the use of products of the pulp, paper, and allied industries, arrangements are being made for the program to center around forest growth and conservation, and the development of paper and its use. Features will include industrial exhibitions showing the derivation and use of paper products as well as equipment used in its manufacture while trade association meetings will provide additional interest.

Invitations to cooperate have been sent to the governors of the Southern states, pulp, paper, and allied industries, and trade and forest associations. Major D. G. Moon has been appointed managing director.

Forest Conservation in Georgia

In connection with a program of forest conservation, the Georgia State Department of Forestry has announced that 22,500,000 slash pine seedlings will be made available for replanting this fall. The cost to farmers and owners of forest lands is two dollars per thousand.

The program now being launched is designed to assure a continuing supply of pulping hardwoods and softwoods for the rapidly expanding pulp and paper industry without depleting the state's resources.

Forest Resources of Northwest Florida

The U. S. Southern Forest Survey report on the forest resources of northwest Florida shows that 83 percent of the total area of 7,287,000 acres in this unit is forest land. Of the 6,017,500 acres of productive forest area, 68½ percent, 4,122,000 acres, is occupied by the longleaf-slash pine type, 509,100 acres by loblolly and other pines, 1,183,800 acres by hardwoods, and 212,600 acres by cypress.

The net board-foot volume in longleaf and slash pines is nearly 2.8 billion board feet about equally divided between round trees and trees worked for turpentine. There are about 1.2 billion board feet in loblolly and other pines. Hardwoods comprise over 2.2 billion board feet and cypress an additional 623 million board feet.

The BUILDER says:

"To give our owners the best materials available, we always use MFMA Northern Hard Maple for floors where Maple is specified."
C. M. GUEST & SONS
Greensboro, N. C.
(Over 40 years of Successful Building Construction)

The ENGINEER says:

"Our experience over 25 years has been that only HARD MAPLE flooring will stand the floor service required in a textile plant. Northern Hard Maple was specified for the Grabur Silk Mill for this reason."
H. V. BIBERSTEIN
Charlotte, N. C.
Mill Architect and Engineer

Above—"Interior of the Grabur Silk Mill, Graham, N. C., where floors of MFMA Maple are giving excellent service."

"A Floor That Makes EVERYBODY Happy"

There's flooring amity ahead where **MFMA** Northern Hard Maple is laid — plants, schools, stores, homes, etc. No questions later of the architect's judgment — no "make this good and that" for the builder — each year merely adds to the owner's satisfaction.

For **MFMA** Maple checks on *all* counts for mills. So tough-fibred, tight-grained, it is remarkably resistant to abrasion — will not sliver, splinter, or develop ridges, even under the wear of heavy steel-castered mill trucks. Its lasting smoothness speeds up traffic, creates no dust to injure machinery, and, properly finished, requires brushing alone to clean. It simplifies alterations, machinery shifting and renewal.

Employees, too, find Hard Maple ideal. Light-reflecting and sound-absorbing — warm, dry and resilient — clean and sanitary. It slows up fatigue, protects health, pleases the eye — in every way contributes to workers' comfort, efficiency, good will.

Everybody's happy when you lay **MFMA** Maple — architect, builder, employee, and owner. You can make sure your flooring is genuine Northern Hard (**MFMA**) Maple, under Association grade supervision and guarantee. This is simply done, by specifying **MFMA*** Maple and looking for this association trademark on the flooring you receive.

• • •

See our catalog data in Sweet's, Sec. 11/76. Write for folder describing heavy-duty finishes for old or new floors, which seal Maple's surface and further reduce cleaning costs.

MFMA *To be sure of Association guaranteed grading, specify and look for the* **MFMA** *trademark (indented and stamped). The following manufacturers are licensed to use it:*

•

Beck, August C. Co., Milwaukee, Wis.
Brown Dimension Co., Manistique, Mich.
Bruce, E. L. Co., Memphis, Tenn. (Mill at Reed City, Mich.)
Connor Lumber & Land Co., Laona, Wis. (Sales Office, Marshfield, Wis.)
Farrin Lumber Co., M. B., Cincinnati, O.
Holt Hardwood Co., Oconto, Wis.
Kerry & Hanson Flooring Co., Grayling, Mich.
Kneeland-Bigelow Co., Bay City, Mich.
Kneeland-McLurg Flooring Co., Phillips, Wis.
North Branch Flooring Co., Chicago, Ill.
Oval Wood Dish Corp., Tupper Lake, N. Y.
Robbins Flooring Co., Rhinelander, Wis.
Stephenson Company, I., Wells, Mich.
Wells, J. W. Lumber Co., Menominee, Mich.
Wisconsin Land & Lbr. Co., Hermansville, Mich.
Yawkey-Bissell Lumber Co., White Lake, Wis.

Floor with
MFMA Maple

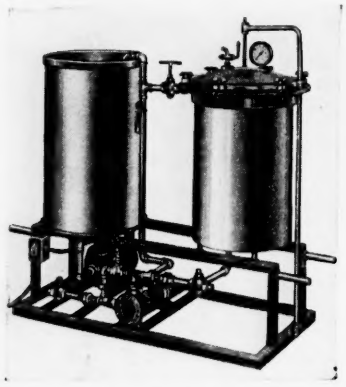
NORTHERN HARD

MAPLE FLOORING MANUFACTURERS ASSOCIATION
1797 McCormick Building, Chicago, Illinois

New Ways of Doing Things

Seitz Tank Furka Filter

Along with new Seitz Filtering Equipment now being announced, is the Seitz Tank Furka featuring an original cylindrical filtering unit. This cylinder provides a larger filter surface in a compact container, with greater simplicity in operation and handling, it is declared,



Seitz Filter With Original Filtering Unit

than the square-frame type of alluvial filter. Standard construction of the new filter includes a tank of nickel-lined steel, heavily tinned bronze filter frames, monel screens, and fittings, pipings and connections of tinned bronze. The filter is made by the American Seitz Filter Corporation of New York City.

Better Type Packing Material

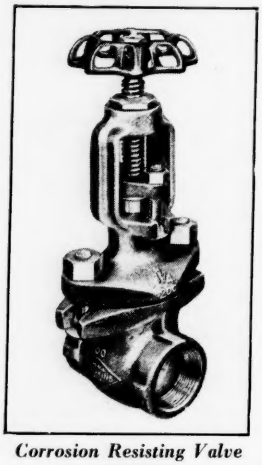
Kraven Machinery Corporation of New York City announces the development and production of a machine for cutting up ordinary waste paper or newspaper and

Cuts Paper for Packing Material

converting it into a "new and better type of packing material." An interesting feature of the machine, known as the Shred-Master, is its manner of automatically interlacing and mixing the paper strands into an uniform, fluffy mass, the lightness of the resulting texture reducing shipping weight. Although four models of the machine are expected to be available soon, production and delivery for the present has been restricted to two models.

Jenkins Stainless Steel Valves

An advanced line of corrosion-resisting stainless steel valves has been introduced by Jenkins Brothers, New cork City. These valves are available in seven different styles—solid wedge or double disc gate valves, union bonnet or belted bonnet Regrinding Globe or Angle Valves, and belted bonnet "Y" valves, all either screwed or flanged. They come in sizes of ½-inch to 3 inches.



Corrosion Resisting Valve

Improved Mauser Precision Tool

The George Scherr Company, New York City, announces it is now handling an improved Mauser precision tool, which may be used both as a Vernier Caliper and a Height Gage. The instrument is known as Model 407-R, 9 inches long, with a measuring capacity of 6¼ inches and measures in 1/1000-inch and 1/128-inch. Its improved feature is a combination quick action cam lock and fine adjusting screw which permits easy setting to close limits of accuracy.

Water-Cooled Mercury Lamp

Westinghouse Lamp Division of Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa., announces a 1000 watt lamp no thicker than a lead pencil, which produces a light exceedingly intense and concentrated. A new principle is employed, mercury vapor in a very small "capillary" tube of quartz, operating at high pressure and water-cooled. The new lamp may be operated on either direct or alternating current.

1000-Watt Lamp No Thicker Than Lead Pencil

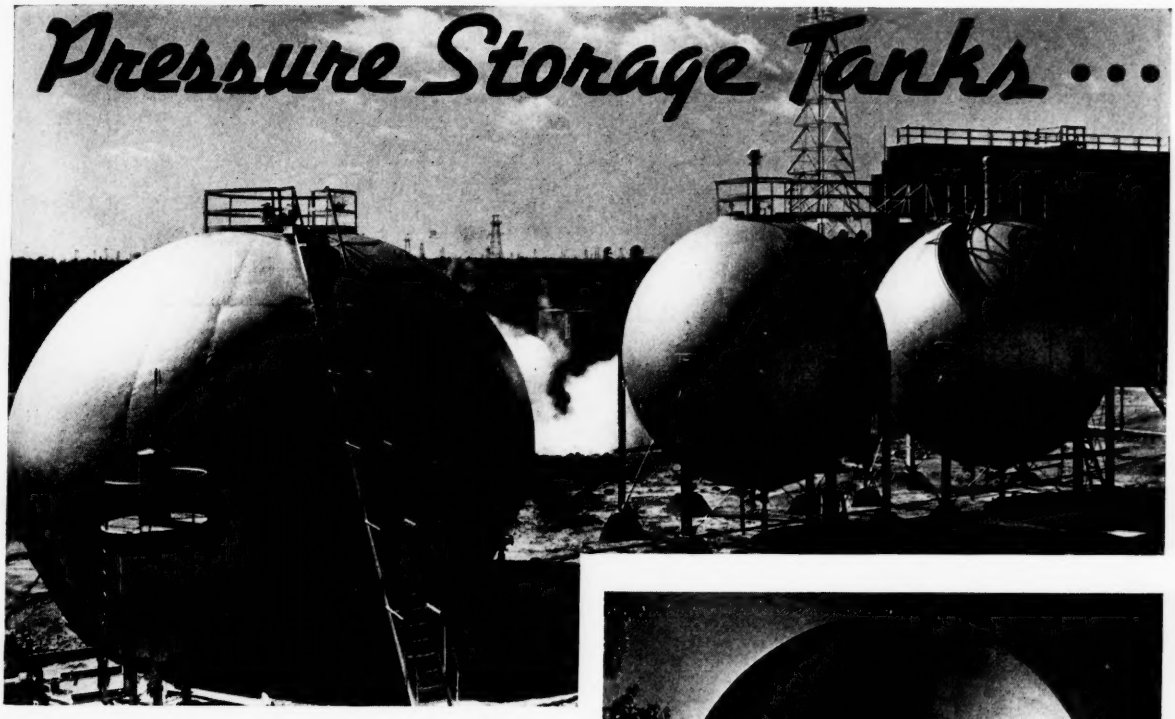
Auxiliary Fire Protection

Auxiliary fire protection for factories, warehouses, docks and industrial plants is offered by a new special duty, factory-installed fire pump as part of the "Clark-tor-6" industrial tractor made by Clark Tructractor, Battle Creek, Mich. This centrifugal type pump is able to handle any kind of water, it is claimed, and is effective whatever the water supply.

Bakelite Fuse Puller

The Trico Fuse Manufacturing Company, Milwaukee, Wis., announces a new line of fuse pulleys known as "De Luxe" Models for pulling and replacing fuses, adjusting switch and cutout clips, avoiding dangers of shocks, burns, infections, blindness, etc., when live electrical parts are being handled. Made of laminations of fine polished black bakelite, these fuses are tested at 35,000 volts dry and 4,000 volts after 24 hours submersion in salt solution.

"De Luxe" Fuse Puller



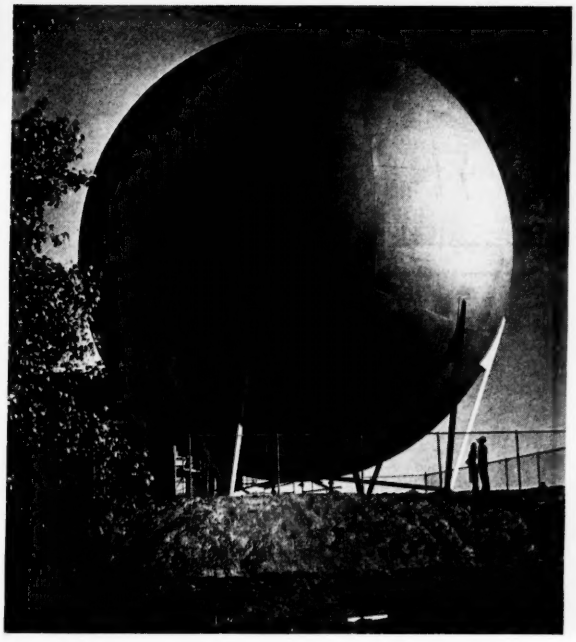
For the handling of LIQUIDS AND GASES

In order to meet present day competition, it is necessary to eliminate excessive evaporation losses from volatile liquids such as motor fuel, natural gasoline, butane and various chemicals. The most economical type of container to provide such storage in commercial quantities is often a spherical or spheroidal structure, depending on the amount of pressure required.

When such tanks are used for this purpose, pressure is built up when temperature variations occur but no vapor is vented out and lost until the setting of the valve is exceeded.

Spherical pressure tanks are also advantageous for the storage of gases. They are relatively small in size and pleasing in appearance. There are no moving parts to require attention or seals to require heating.

Write our nearest office for information or quotations on installations to meet your requirements.



THE HORTONSPHEROID (illustrated at left in top view) is used to store natural gasoline, motor fuel and other volatile liquids under pressure to prevent excessive evaporation loss. Standard sizes from 2,500 to 100,000 bbls. capacity for 1 to 30 lbs. per sq. in. pressure.

THE HORTONSPHERE provides an economical method of storing liquids such as butane under pressure (top at right) and gases in distribution systems or at sewage disposal plants. (above) Built in sizes up to 60 ft. diameter for pressures up to 100 lbs. per sq. in.

CYLINDRICAL TANKS of welded construction built up and shipped complete. Vessels requiring X-raying and stress-relieving fabricated at Birmingham and those meeting paragraph U-69 of the A.S.M.E. Code for Unfired Pressure Vessels or equivalent specifications at all three plants.

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Houston .....2919 Main Street	Chicago .....2106 Old Colony Bldg.	Boston .....1510 Consolidated Gas Bldg.
Tulsa .....1611 Hunt Bldg.	San Francisco .....1040 Rialto Bldg.	Havana .....Edificio Abreu 402

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A COMPLETE ORGANIZATION

Our complete organization with years of experience in successfully executing large construction contracts of various kinds is prepared to undertake the construction of earth, masonry and concrete dams, drydocks, dredging of all kinds, river and harbor improvements, deepening channels, hydraulic filling and rock work, tunnels, railroad construction, sewers and waterways.

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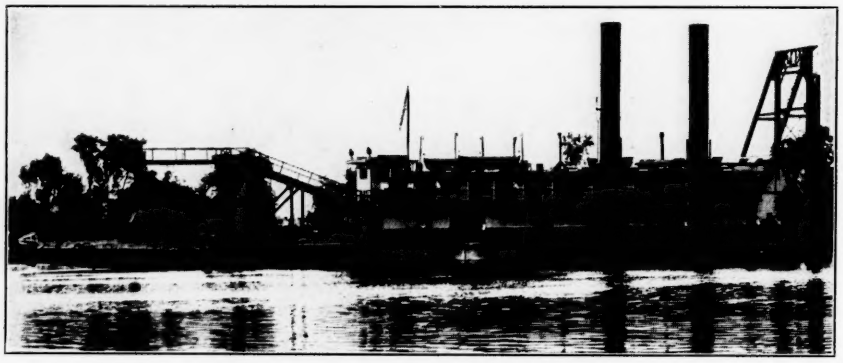

We are especially equipped to execute all kinds of dredging, reclamation and port works in Southern waters.
Correspondence invited from corporate and private interests everywhere.

Contractors to the Federal Government

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New · Low in Price

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At one writing, this new low-priced Burroughs Desk Bookkeeping Machine produces pay check (or pay envelope), employee's statement and a record of the employee's earnings and deductions.

FOR BOOKKEEPING

Because it writes dates, adds debits, subtracts credits and extends the new balance, this modern Burroughs posts any ledgers, writes monthly statements, and handles all miscellaneous figure-work inexpensively.

FOR ADDING AND SUBTRACTING

The famous Burroughs Short-Cut Keyboard provides the fastest method for listing, adding and subtracting amounts. Subtraction is as fast and easy as addition.

Large concerns find that certain accounting jobs in different departments can now be mechanized at extremely low cost with this new Burroughs.

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Let the Burroughs representative show you, in your own office and on your own work, what these savings can actually mean to you. Telephone the local Burroughs office, or mail the coupon for free, descriptive folder.

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Send me your folder describing the new Burroughs Desk Bookkeeping Machine.

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How much monthly would your family need if you died? - - $.....

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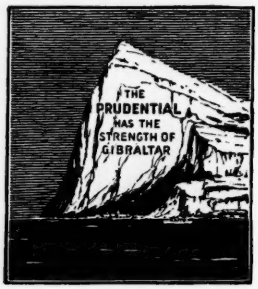
Ask about our Monthly Income insurance plans.



THE PRUDENTIAL

INSURANCE COMPANY OF AMERICA

HOME OFFICE: NEWARK, N. J.

» » » *Finance* « « «

AND KINDRED SUBJECTS

Opposition to Government Bond Tax Exemption

The Twentieth Century Fund's Committee on Debt Adjustment is conducting a three-year study of the entire debt structure of the nation. It is opposed to Federal, state and local government securities being exempted from income taxes. This for various reasons, among them that tax exemption makes it too easy for government bodies to go into debt, and makes government securities too attractive to those wealthy people best able to afford the risk of direct ownership in other equities.

The Committee's study has shown that while Federal debt has mounted rapidly since the beginning of the depression, debts of state and local governments have declined since 1933. Another finding is that "almost all new issues of government bonds have been bought by banks, life insurance companies and other credit institutions, which means that the savings of individuals, flowing through such institutions, have gone almost entirely into government bonds in recent years.

"With rising incomes in 1933-37, individuals undoubtedly saved a good many billion dollars. But almost none of this saving has been invested in the normal forms of new houses and new corporate bonds.

"This does not necessarily demonstrate that the increase of government debt was the only path to prosperity. It is safe to assume that with business improvement more is saved, and if savings do not find some channel of use recovery cannot continue."

American Tax Payers League Program

The American Taxpayers League announces its objective is "to break the jam that prohibits the flow of capital into business channels, now dried up or stagnated by excessive (tax) rates." It is lending its support to a bill introduced in the House by Congressman Celler of New York at the last session, limiting by constitutional amendment the taxing powers of government to 25 per cent maximum.

The League also opposes the enactment of the undistributed profits tax, the repeal of the capital gains tax, and a horizontal reduction of 25 per cent or more in the income and death tax levies.

It announces: "we advance this program with a full understanding of the responsibility involved and with confidence in its success."

Gold Holdings

America's gold holdings now amount to $13,516,000,000. This is nearly four times the amount of Great Britain, and five times that of France. Germany's store is reported to be $29,000,000.

Our Investments Abroad

Foreign capital has been coming into America of late ot an unprecedented rate. The Department of Commerce gives the amount of foreign investments in this country as amounting to $7,000,000,000, while American investments abroad at the end of last year were more than $11,000,000,000.

"A Doctored Yardstick"

The Dallas Morning News, in calling attention to the announcement a while back that 52 per cent of the cost of dams and facilities constructed by the TVA would be charged to power production, says: "By charging off $45,000,000 of the cost of these dams to social benefits, the directors of TVA propose a subsidy of approximately $2,000,000 annually for the government operation of power plants. There is no other way of figuring it. Of course, consumers of TVA energy will get

(*Continued on page 50*)

U. S. Army Base, Brooklyn, N. Y.
30,700 sq. ft. CWG Skylights.

SPECIFY ORIGINAL SOLID CORRUGATED WIRE GLASS

It *diffuses* light with a minimum of shadows. *It is practically* self-cleaning and can be used on a roof of any material and supply daylight in manufacturing and industrial plants—an important factor in all modern production.

Also used with excellent results on sidewalls, marquises, canopies and wherever daylight is needed.

Our Engineering Service Department can aid you on your skylighting problems. Write or wire.

PENNSYLVANIA WIRE GLASS CO.
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LONG LIFE TO LUMBER!

To add from 8 to 20 times the ordinary life and service you might expect from your lumber, use only pressure-preserved woods treated with ZMA or Creosote. Eppinger and Russell Co. has, for 60 years, been treating poles, ties, posts, piling, cross arms, cross ties and other timber for the nation's leading industrial firms and utilities. Safeguard your lumber against dry rot and termites by employing this outstanding wood-treating service.

PRESSURE-TREATING PLANTS AT:
Jacksonville, Fla.
and
Long Island City, N. Y.

WOOD PRESERVERS SINCE 1878
EPPINGER AND RUSSELL CO.
84 Eighth Ave., New York City

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From a watchman's shelter to a complete plant. Maryland Metal Buildings fulfill any requirement . . . at the lowest cost per square foot of floor space. Standard or designed to your requirements. Insulated if desired. Conform to A.I.S.C. Specifications. Permanent, yet easily remodeled to fit changing conditions.

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MARYLAND METAL BUILDINGS

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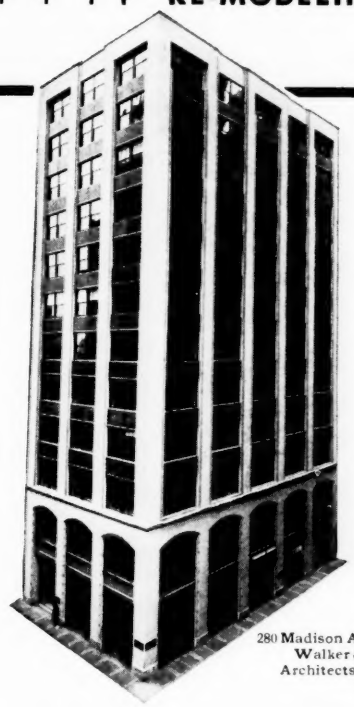
THIN STONE SPANDRELS *for* ECONOMICAL RE-MODELING



280 Madison Ave., New York;
Walker & Gillette,
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The nature of other commonly used stones makes it difficult or impossible to use them in light thicknesses, but since Virginia Green Tremolite has great toughness, density and uniformity of grain as well as strength, it can be cut into sections as thin as 7/8". In honed finish, it shows clean white markings. It polishes naturally to a dark green, and holds its polish indefinitely.

We urge that advantage be taken of this quality, and the stone used *thin*. Not only do thin sections save money for clients, but they may be of considerable help to the designer—as for example, in affording greater depth of reveal in the case of spandrel sections.

We will be happy to send you a set of samples, conveniently boxed, showing the range of stone, including black and mottled dark blues and greens, from the Alberene Quarries at Schuyler, Va. Please address: Alberene Stone Corporation of Virginia, 419 Fourth Ave., New York, N. Y. Sales Offices in Principal Cities.

Virginia GREEN TREMOLITE

While cosmopolitan in its general appeal, and modern *up to this moment* in its equipment, there is a peculiar flavor of The Old South here which Southerners are quick to note and appreciate. They feel at home and come back to us again and again.

Rates $3.00 *per day and up. Every room with bath or shower. Centrally located.*

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Member Federal Reserve System
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SAND—GRAVEL—BRICK
FILTER GRAVEL
Washed Sand and Gravel for Concrete Roads and Buildings
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FREE *sample copies sent to executives on request.*
44 BROAD ST., NEW YORK, N. Y.

"Finance and Kindred Subjects"

"A Doctored Yardstick"

(*Continued from page* 48)

lower rates, but the country as a whole will get higher taxes. The TVA operation, as proposed by the present directors, will be a doctored 'yardstick.' "

Changes Wanted in Labor Act and Board

Changes in the Wagner Labor Relations Act no doubt will be taken up for consideration at the next session of Congress. Not only is the act declared by business men to be unworkable in the interest of harmony among employers and employees, which purpose it was supposed to promote, but the American Federation of Labor at its Houston meeting opposes the re-appointment of a member of the National Labor Relations Board. He and another member of the 3-man Board ahe accused of showing bias in favor of the CIO. The A. F. of L. executive council proposes to press upon Congress amendments to the Wagner Act so as to curtail the powers of the Board.

Railroad Matters of Interest

As further indication of business improvement, railroad carloadings are showing an encouraging increase. Notwithstanding the storm on the Atlantic seaboard in the latter part of September, which caused a virtual tie-up of traffic in many localities, a larger gain than ordinary in car loadings was made for the week ending September 24, when the increase over the week preceding was 15,411 cars. The last week of September recorded total loadings of 675,553, which is a high point so for this year. The nearest figure to the stated total was reached November 13, 1937, when the total was 688,61 cars. Revenues in September are likely to reach the highest levels for 1938 owing to better freight rates.

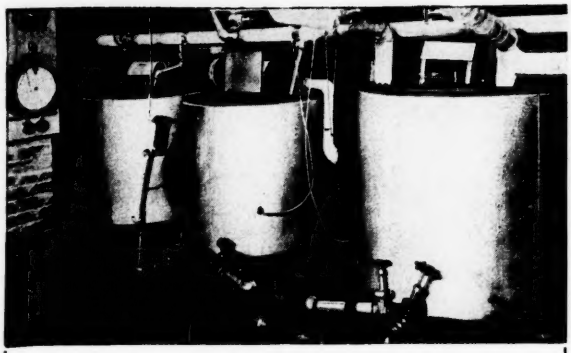
Hearings on the proposal to reduce the pay of railroad workers are being held by the Board appointed by the President. Press dispatches indicate that the decision will be delayed while the Board investigates other matters which it considers have a bearing on the demand for a cut in wages. Counsel on both sides, as was to be expected, present diametrically opposite views and the Board hopes to find the basic cause of the problem with a view to making public the facts which may be brought out.

The Union attorneys claim that a cut in wages will be the signal for wage cuts in other industries, and is part of a conspiracy to cut wages everywhere and delay recovery. Dr. Parmalee, Director of the Bureau of Railway Economics, and a recognized authority, contended that the financial crisis the railroads face threatens their continued life. He gave facts to show that the gross deficits of the railroads in the first eight months of this year amounted to a record peak of $182,000,000. He admitted, under cross examination by the Railway Counsel, that the railroads are over-capitalized more than $4,000,000,000.

Will Larger Bank Deposits Be Insured?

The Federal Deposit Insurance Corporation is asking banks a series of questions to help in determining whether or not to extend deposit insurance beyond the present maximum of $5,000 on each deposit.

The F.D.I.C. is said to be studying the matter to determine what the additional risk would involve. It will be interesting to know the bankers' attitude. Bank earnings are not overlarge at present to put it mildly, and while it may help smaller banks to get some larger deposit accounts, they are likely to hesitate about assuming any considerable additional expense.



Section of Battery built for Lanett Mills of West Point Mfg. Co., West Point, Ga.

Nickel-Clad Starch Kettles

Fifteen starch kettles were made by us on this special job. These sizing kettles are made of Nickel-Clad steel to eliminate cracks and provide corrosion resistance. Monel metal agitators and heating coils were installed inside for greater strength, toughness, and freedom from contamination or discoloration of product. Welded construction throughout.

Starch boxes, kettles, jig boxes, etc., of Nickel-Clad steel as well as other metals made to order.

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R. D. COLE MANUFACTURING CO.
ESTABLISHED 1854
NEWNAN GEORGIA

TANKS

Made to your specifications of steel, stainless steel, stainless clad, monel, nickel, nickel clad, copper, aluminum and alloy metals.

PLATE and SHEET FABRICATORS
From 1/16" to 1" in thickness

Our 25 years of experience in fabricating pressure and non-pressure tanks, smoke stacks, smoke breechings, hoppers, bins, chutes, storage heaters, instantaneous heaters, condensers and kindred equipment is at your command.

RICHMOND ENGINEERING COMPANY Inc.
RICHMOND — VIRGINIA

CREOSOTED TIES, PILING, POLES, POSTS, CROSS ARMS, and LUMBER

WOLMANIZED LUMBER—
Decay and Termite Proof—Can Be Painted
Docks for Ocean Vessels

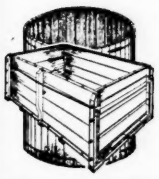
American Creosote Works, Inc.
New Orleans, La.

Atlantic Creosoting Co., Inc.
Norfolk, Virginia

Plants at: New Orleans; Winnfield, La.; Louisville, Miss. Savannah, Ga.; Jackson, Tenn., and Norfolk, Va.

WOOD TANKS

Wood Stave Pipe



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Tanks any size for all purposes.

Towers any height for tanks.

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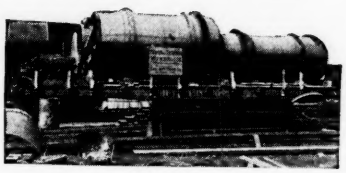
THE BALTIMORE COOPERAGE TANK & TOWER CO.
Baltimore, Maryland
The Largest Works of Its Kind in the South

SOUTHLAND PRODUCTS
—WELDED OR RIVETED—



We now manufacture and offer to the trade tanks in all sizes for pressure or gravity work. Also other steel equipment of either

WELDED OR RIVETED CONSTRUCTION

This applies to field as well as shop built equipment.

Write us for information and quotations.

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INDUSTRIAL NEWS

North Carolina Industrial Directory

R. Bruce Etheridge, Director of the North Carolina Department of Conservation and Development, and Major A. L. Fletcher, Commissioner of Labor, announce the early completion of an industrial directory and reference book to include a list of all manufacturing firms and commercial houses in North Carolina. The book, a volume of several hundred pages, is a joint undertaking of the two departments. Copies will be available for distribution about December 1.

TRICO Fuse Distributors

Trico Fuse Manufacturing Company, Milwaukee, Wis., announces the appointment of Marine Specialty & Mill Supply Company, 201 Julia Street, New Orleans, as agent-distributors for Louisiana and Southern Mississippi of the complete line of TRICO Powder-Packed Renewable Fuses, KANTARK One-Time Fuses, COLORTOP Plug Fuses, TRICO-MATIC Thermal Time-Lag Plug Fuses, TAMRES Tamper-Resisting Fuses, Special Fuses, KLIPLOK Clamps for fuse clips, Test Clamps, Fuse Pullers and Lubricators.

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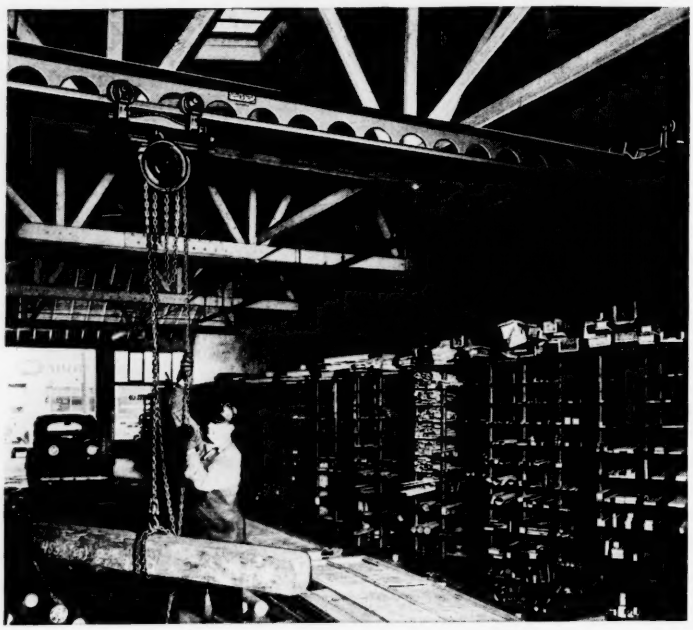

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Division of

THE CLEVELAND CRANE & ENGINEERING CO.

1145 Depot St.

WICKLIFFE, OHIO

Will Install Koppers Phenolate Plants

The Sun Oil Company has awarded contracts to the Engineering and Construction Division of Koppers Company, Pittsburgh, Pa., for two Koppers phenolate plants for purifying refinery still gas. One plant, employing a two-stage system, with a capacity of 10,000,000 cubic feet of gas a day, will be installed in the oil company's refinery at Toledo, Ohio, and a single-stage plant of 12,000,000 cubic feet daily capacity will be installed in the refinery at Marcus Hook, Pa.

84-Foot Bubble Tower

Fabricated at its Birmingham plant, the Chicago Bridge & Iron Company of Chicago, Ill., recently manufactured for the Rock Island Refining Company at Duncan, Okla., a bubble tower 11 feet in diameter by 84 feet in length.

Purchases Eureka Cottom Mill

Purchasing the property from RFC at a cost around $60,000, C. L. Upchurch & Sons, Inc., Athens, Ga., will liquidate the machinery of the Eureka Cotton Mill at Englewood, Tenn., including carding, spinning, knitting and sewing equipment, mill building and village. It is likely, however, that the knitting and sewing plant will go back into the building, as the Upchurch organization has a prospective customer for it.

ARMCO Galvanized SEAL-KRIMP Roofing

The American Rolling Mill Company of Middletown, Ohio, announces a new type of galvanized roofing with a patented Spring-pressure lap and other exclusive features, known as "ARMCO Galvanized SEAL-KRIMP Roofing." It is declared to be storm-proof, weather-tight and easily installed, costing no more than the ordinary type of metal roofing per square. The new roofing is available in three grades of metal—copper-bearing steel, open-hearth steel and ARMCO Ingot Iron—and is ideal for farm buildings, factory buildings and homes. Roofing accessories are also available.

Herman Davidson

Announcement is made of the death September 1 of Herman Davidson, president of the Albert & Davidson Pipe Corporation of Brooklyn, N. Y.

Lincoln Foundation Awards

"The Jury of Award of the James F. Lincoln Arc Welding Foundation, Cleveland, Ohio, after judging thousands of papers submitted in the $200,000 award program, found that savings to industry by arc welding claimed by authors of papers aggregate $1,600,000,000. The Jury's statement, released September 15 follows:

"The Central Committee of the Jury of Award of the James F. Lincoln Arc Welding Foundation finds that the savings to industry by arc welding claimed by authors of papers aggregates $1,600,000,000. This figure is arrived at after discounting some very enthusiastic claims. It is an amazing figure and undoubtedly would have been much greater had all of the authors estimated gross savings from the application of arc welding to their products."

Altogether, 382 awards were made by the Foundation, amounts ranging from $101.75 for honorable mention to $13,941.33, the grand award. Recipients included engineers, designers, architects, production managers, superintendents, draftsmen, shop foremen, mechanics, inspectors, welding operators, welding supervisors, owners of businesses, college professors, high school instructors, students, and others. Subjects of studies in the 44 divisions of the program, represented practically every product and structure of industry.

The Grand Award of $13,941.33, went to Mr. and Mrs. A. E. Gibson, president and stockholder, respectively, of The Wellman Engineering Co., Cleveland, Ohio. Their paper, "Commercial Weldery," entered in the Welderies Classification of the Program, is a treatise on all the elements required to assure the business and technical success of users of welding throughout industry.

An award of $11,397.06 was received by Anant H. Pandya and R. J. Fowler, engineers, Diagrid Structures, Ltd., London, England,

(*Continued on page 54*)

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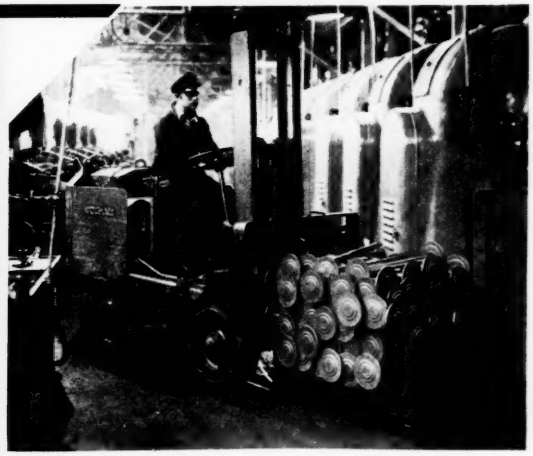

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Mr. James J. Alvarez, 408 Merchants National Bank Bldg., Mobile, Alabama. Phone: DExter 5882.

C. G. Forshey, 909 M & M Building, Houston, Texas. Phone: Capitol 5525.

McVoy-Hausman Co., 2019 Sixth Avenue North, Birmingham, Alabama. Phone: 7-5561.

INDUSTRIAL NEWS

(*Continued from page 52*)

who presented a paper on "The All Welded Grid Applied to Plane and Spatial Structures," discussing the elimination of trusses and columns except at corners of bays. This design, claim the authors of the paper, makes a saving of $60,000 available to industry.

An award of $8,852.94 went to Robert E. Kinkead, consulting engineer, Carnegie Illinois Steel Corporation, Cleveland, for a paper on "Industrial Machinery Steel Making," and an award of $7,326.46 went to L. J. Carey and Marvin Whitlock, foreman and engineer, respectively, American Air Lines, Inc., Chicago, for a paper titled "Welded Aircraft Piping." The remaining 378 awards were spread over eleven classifications of the award program.

Plant and Machinery Offered

Gerth's Realty Experts, auctioneers of New Orleans, La., offer for sale at auction at the plant at Saginaw, Mich., on October 14, the land, buildings, machinery, and material equipment of W. B. Mershon Co. Catalogues and information may be obtained by communicating with the auctioneers' representative on the premises.

TRADE LITERATURE

FLUTED MONOTUBE PILES—
Catalog No. 68—illustrated, describing the product and method of installation of Cold Rolled Fluted Steel Monotube Tapered Piles, with engineering data.
The Union Metal Manufacturing Company, Canton, Ohio.

CHEMICAL ENGINEERING CATALOG—
The Chemical Engineering Catalog for 1938, twenty-third annual edition, has been issued by its publishers, the Reinhold Publishing Corporation, 330 West 42nd Street, New York. Designed for the use of the process industries, the catalog was inaugurated in 1915 by the American Institute of Chemical Engineers. It presents collected, condensed and standardized data on equipment, machinery, laboratory supplies, heavy and fine chemicals and raw materials used in industries employing chemical processes of manufacture, with classified indexes of such equipment and materials, carefully cross-referenced, and a technical and scientific books section, cataloguing and briefly describing a very complete list of books in English on chemical and related subjects. The volume contains a total of 1034 pages.

CONSTRUCTION EQUIPMENT—
Official Publication—"The Orange Peel," presenting a partial list of equipment carried in stock by Equipment Corporation of America, and featuring a story of the construction of Mexico's new cooperatively owned sugar mill at Zacatepec, for which construction equipment was supplied by—
Equipment Corporation of America, Chicago, Ill.; Pittsburgh and Philadelphia, Pa.

PROPELLER FAN BLADES—
Bulletin—devoted to ARISTOCRAT Quiet Propeller Fan Blades and other Torrington Air Impellers.
The Torrington Manufacturing Company, Torrington, Conn.

HEAT ECONOMIZERS—
Bulletin No. 35-76—"ADSCO Heat Economizer," illustrated, copies available from—
American District Steam Company, North Tonawanda, N. Y.

COMPRESSED AIR INDUSTRY—
Trade Standards Pamphlet—new edition, doubles size of previous edition and includes much new material—such as sections on rotary compressors and vacuum pumps, centrifugal compressors and blowers, compressor accessories, rock drills and pneumatic tools, additional charts, tables, etc.
Compressed Air Institute, 90 West Street, New York.

POWER SHOW—
Folder—devoted to the coming 13th National Exposition of Power and Mechanical Engineering to be held at Grand Central Palace, New York, December 5-10, 1938.
National Exposition of Power and Mechanical Engineering, Charles F. Roth, Manager, Grand Central Palace, New York.

"USIFLEX" JOINT PIPE—
Booklet—illustrating and describing "Usiflex" Joint Pipe, primarily designed for submarine lines, such as river crossings, water intakes, outfall sewers and other types of pipe installation where a large amount of joint deflection is required.
United States Pipe and Foundry Company, Burlington, N. J.

STEEL BUYERS' GUIDE—
Booklet—handy pocket size publication giving complete listings and descriptions of the wide range of Certified Steels and allied products carried in stock for immediate shipment, with reference tables, weight charts, standard specification listings, etc.
Joseph T. Ryerson & Son, Inc., Chicago, Ill.

MONAT PACKLESS VALVES—
Bulletin B—illustrating and describing Monat Packless Valves.
Monat Valve & Forge Company, Inc., Pittsburgh, Pa.

ALUMINUM WINDOW SILLS AND COPINGS—
Booklet—"Window Sills and Copings of Alcoa Aluminum," illustrated, outlining advantages of using this product for the purposes enumerated.
Aluminum Company of America, Pittsburgh, Pa.

"COME ALONG" TOOL—
Pamphlet—illustrated, devoted to "Come-Along" Tool for pulling heavy machinery, as fence stretcher, hoist, and for other services.
J. E. Shaffer Company, Tulsa, Okla.

C-A WOOD PRESERVER—
Folder—illustrated, devoted to C-A Wood Preserver (Carbolineum America), a long-lasting attractive outside brown stain.
C-A Wood Preserver Company, St. Louis, Mo.

"AMERICAN" EQUIPMENT—
Catalog 100-H-1—devoted to "American" General Purpose Hoist;
Catalog 100-H-5—"American" Oil Field Engines;
Catalog 600-L-2—"American" 40 and 50 Ton Locomotive Cranes.
American Hoist & Derrick Co., St. Paul, Minn.

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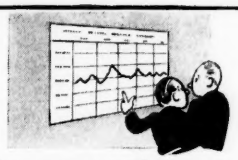
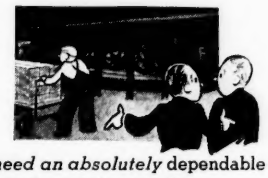


"We want an air compressor that meets our air needs exactly—to insure adequate and economical operation."

"With our limited floor space, we need a compressor that packs a lot of air output *in small area."*

"Low horsepower per cubic foot of air delivered is another 'must' for our air compressor."



"Naturally, we need an absolutely dependable *compressor —production must be* uninterrupted."

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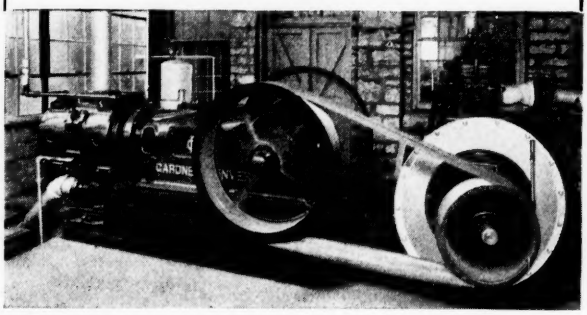

Gardner-Denver "RX" Compressors are made in capacities from 89 to 628 c.f.m. for 100 lb. pressure, also in larger capacities for low pressure and vacuum service. They are available in sizes to fit your floor space, using any type drive. The horsepower consumed per cubic foot of air delivered is consistently *low*. Here's a compressor that fits YOUR needs—write for our bulletin giving complete facts about it. Gardner-Denver Company, Quincy, Illinois; Atlanta, Ga.; Birmingham, Ala.; Knoxville, Tenn.; Dallas, Texas; Houston, Texas; Washington, D. C.

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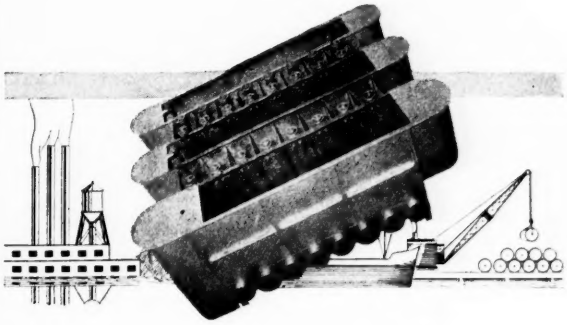

Paper mill men used to build these big head boxes of wood. Not because they wanted to, but because they couldn't find anything else at reasonable cost that would do the job.

Now it's Armco Stainless Steel of a specific grade — a grade that strengthens the equipment, extends service life and, most important, enables production of finer, cleaner, more saleable paper.

We're forgetting about the "pretty" uses of Armco Stainless in this advertisement. The real tough jobs are on our mind — high strength, corrosion resistance, heat resistance, for example.

When you are looking about for the *one right metal*, remember there is a grade of Armco Stainless suitable for the need . . . And experienced research engineers to help you apply it thriftily. Write us. The American Rolling Mill Co., 3071 Curtis St., Middletown, O. District Offices in All Key Cities.

ARMCO

ARMCO

STAINLESS STEELS

Unique Steel Making Plant

(*Continued from page 29*)

ingots and the other for further reducing the bars into convenient sizes for test specimens. The larger mill is capable of reducing a four-inch ingot to a one-inch square. The smaller mill, which simulates conditions in a billet mill will reduce a 1¼ inch square to ½ inch square. A surface combustion furnace for billet heating, a heat treating furnace, a small soaking pit, a 500 pound steam hammer and a welding machine complete the equipment in the pilot plant.

The products of the pilot plant, made under conditions which simulate commercial production, are subjected to a variety of tests and investigations in the physical and metallographic laboratories.

Specimens, prepared in the machine shop on the latest designs of lathes, milling machines and metal cutting saws, are transferred to the physical laboratory for testing. Here, in addition to the usual tensile, impact and hardness testing machines, are installed a variety of fatigue and repeated impact testing machines, a stiffness tester for sheet and strip, a dilatometer, and other special equipment. A damping capacity tester, one of the first to be used in this country, is provided to measure the internal friction of metal by the method of free vibrations in connection with studies on aging and on sensitivity of steels to cold work.

A well equipped metallographic laboratory is used here to study steel prepared in the pilot plant. The equipment includes a Zeiss microscope equipped with camera with which micro-photographs of the grain structure of steel may be taken at magnifications up to 4,000 diameters.

In general, the work at the pilot plant is being directed toward improving and controlling the physical properties of carbon steels. In this connection, work is being carried on in the field of non-aging steels. Investigations of machinability are being continued by the research department and in this work, a high speed motion picture camera has been used to photograph the split-second cutting action of tools on a lathe in the machine shop.

Railroads Spend Over $30,000,000 Annually in Louisiana

(*Continued from page 33*)

had the effect of changing these ratios, but suppose only 30 per cent of the 1937 railway taxes in Louisiana were earmarked for schools, the amount thus allocated would be sufficient to defray the annual cost of providing public education to some 29,000 Louisiana children.

The foregoing facts relating to the Class I railroads of Louisiana reveal total 1937 disbursements in the state for fuel, materials, supplies, labor and taxes of more than $32,500,000—not including payments for numerous items and services for which data have not been compiled, such as electric light and power, payments to construction contractors and for other contract work, buildings, land, etc., insurance, advertising and other miscellaneous items. Nor does the foregoing figure include interest payments on railway securities, or dividends on railway stocks. Neither does it include payrolls, taxes, purchases or other disbursements made by scores of short-line railroads in and outside the state. Total expenditures, disbursements and payments of all kinds by the railway industry in Louisiana last year would in all probability be several million dollars greater than the above figure.

How much more would the railroads be likely to spend in Louisiana if the industry were in a prosperous condition, if railway traffic was fairly heavy and if railway rates and revenues were sufficient to enable the railroads fully to meet their expenses, fixed charges and taxes and to pay their owners—the stockholders—a reasonable return upon their invested capital? Of course, no one knows exactly, but here are some striking and significant facts which show how railway spending follows railway earnings more specifically, net earnings:

In the five-year period 1925-1929, when the railroads of the country as a whole earned an annual return of better than 4

(*Continued on page 58*)

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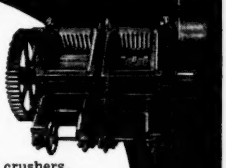

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McLanahan & Stone Corporation

Established 1835

Hollidaysburg, Pennsylvania

Railroads Spend Over $30,000,000 Annually in Louisiana

(*Continued from page 56*)

per cent on their property investment, they spent an average of $5,072,000,000 a year for fuel, materials, supplies, labor and additions and betterments.

In the deep depression years of 1932 and 1933, when the railroads as a whole earned a return of only about 1½ per cent on their property investment, and when many railroads failed to meet bare expenses of operation, their expenditures for the same purposes averaged only $2,049,000,000 a year.

In 1937, when the railroads as a whole earned a return of about 2¼ per cent on their investment—a substantial improvement over the worst years of the depression, but still far from a satisfactory return—they spent $3,462,000,000.

Should business activity and railway earnings be restored to around the 1925-1929 level, it is reasonable to expect that the business interests of Louisiana would share proportionately with those of other states in increased railway purchasing power and increased railway employment and payrolls.

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A TYPE OF POWER TO SUIT EVERY NEED

Gasoline or Diesel Mechanical Drive

●

Gasoline or Diesel Electric Drive

●

Electric Storage Battery

●

Electric Trolley

This is one of two new model, 6-ton, Diesel-powered Whitcomb Locomotives recently shipped to Dutch Guiana Mines in the heart of the jungles. The track system for this operation is of necessity very temporary in nature. The heat and humidity reaches a point seldom, if ever, experienced in the United States. Notwithstanding the unusual conditions, these locomotives will be manned by natives, which is a tribute to Whitcomb simplicity and dependability. Whitcomb Locomotives of 18-ton capacity will be used to haul ore to the mill.

For over 65 years, Whitcomb Locomotives have been doing tough haulage jobs efficiently and economically. Find out how Whitcomb haulage will save you expense. Let our engineers survey your needs and make recommendations without obligation.

THE WHITCOMB LOCOMOTIVE COMPANY

Plant at Rochelle, Illinois

Subsidiary of The Baldwin Locomotive works. All sales made by The Baldwin Locomotive Works, Paschall Station Post Office, Philadelphia, Pennsylvania.

Chemical Industries Based on Petroleum

(*Continued from page 31*)

upon elementary sulfur, iron pyrites and roasting of sulfide ores must compete with sulfuric acid from hydrogen sulfide produced in the oil industry itself.

Natural and refinery gases contain hydrogen sulfide from a fraction to over 10 per cent. Several refineries have installed sulfuric acid making plants using cracked gases containing hydrogen sulfide which is extracted and then oxidized to 66 Be. sulfuric acid at the rate of over 75,000 tons a year. In terms of the 50° Be. acid previously used, this production amounts to about 100,000 tons per year which has replaced other sources of sulfuric acid.

In manufacturing the acid, the hydrogen sulfide is burned so that the combustion products contain sulfur dioxide and oxygen in the proportions required for catalytic conversion in sulfur trioxide. The sulfur trioxide is absorbed in strong acid in the usual manner. In this conversion 7,640 standard cubic feet of hydrogen sulfide are chemically equivalent to 1 ton (2000 lb.) of sulfuric acid. In actual practice the amount is slightly greater due to losses and incomplete conversion of sulfur dioxide to sulfur trioxide. This competition is particularly serious due to the fact that the use of sulfuric acid in the oil industry is definitely decreasing since the introduction of newer methods of refining, such as, solvent extraction, antioxidants, color inhibitors, and dyes. The quantity of acid used in the oil industry in 1936 was 10 per cent or 140,000 tons less than that used in 1932, although during the same period of time, the amount of crude oil refined had increased from 785,159,000 barrels to 1,098,516,000 barrels, or 40 per cent.

The large volumes of hydrogen sulfide available for conversion to sulfuric acid will place the oil industry in a position to market its acid outside for other than its own uses. The cost of sulfuric acid from hydrogen sulfide is materially less than from other sources. More sulfuric acid can be produced by the oil indutry from the hydrogen sulfide potentially available in natural gas, crude oil and refinery gases than the whole requirement of the U. S.

One can predict in view of the enormous yearly (1937) production of natural gas (2,000,000,000,000 cubic feet), natural gasoline (50,000,000 barrels), and crude oil (1,277,653,000 barrels), and the variety of hydrocarbons available that the oil industry will be the foundation stone of more chemical industries.

(*Continued on page 61*)